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o ors

Campbell R. McConnell ar s . . ro rs y o o a a r r r s ro or ll oll a rs y o ll o s. a a - rs y o ras a- ol ro 1 1 s r r 1 0. s also o- a or o *Con em o a Labo Economic* , . (Gra - ll) a as r a rs or r l s a la o r o o s o rs s. s a r o o rs y o ras a s s a ar a a s . a a- r o ar , a s as - r s o s o o s sso a- o . ro ssor o ll as a ar a o orary o or o a s r ro or ll oll 1 a r s s s ar 1 . s r ary ar as o r s ar la o r o o s a o o a o . as a s oll o o a r or s a oys r a a s ory.

Stanley L. Brue s r ra a or a s a a oll ( ) a r s . . ro rs y o ras a- ol . a s a a ra rs y, r as o o r as a r o rl o or r a l y ar . as also r a o al a y ar or ll o o a o . ro ssor r s as r s a a rr r o r a o al oar o ro l a s lo r a- o al o o s o orary. s oa or o *Economic Scene* , . (r - all) a *Con em o a Labo Economic* , . (Gra - ll) a a or o *The E ol ion of Economic Tho gh* , . (/ ry). or r la a o , oys oa - o o a s r s s a ly.

Thomas P. Barbiero r s . . ro rs y o oro o a r o l - r ra a s s a sa rs y. as l s a rs o rol o a r l ral s or s r al lo o or r aly r o 1 1 1 1 . s r s ar r s las y ars as r o o o o olo y a a l a o o o o ory o la so al o a. ro ssor ar ro s s ar o s s r o al oas aly.

r a

l o o o o *Mic oeconomic* , or r a's s -s ll o- o s oo . or a ll o a a a a . . s s a o s s oo . as a a o s ral a , al a , ss a , a s - o s, a ra sla o r , a s , a o r la a s.

WHAT'S NEW AND IMPROVED?

oro ly r s , ol s , a a s o . o s a so ar a alo y, s s rs o .0, o .1 or .2. o s o r rs a s r y orr s o s ro o ra , o a ro s, a s ar o a o .

Streamlined Presentations

a or r s o oal as o s r a l r s a o s, r oss l , o o - ro s oro ss o o r la a o s. r or s r s l a or - or a a o a r a r lar y. a l s a r , r o ar ys a a a a o o y, s o s or r a r or a a or . o ll s lar s o ro s ro o o . r , o o rs , ra s o la a o r a s a s s ara r s o *Mic oeconomic* . r y a s o lar y s a als o o y.

Improved Content

y o s, a ar o , a r or ar o s y ar s ss la r . s s r s o ra y o s ro o . a a a r o ro s ss o s l ss a a or r s y a a s ra , a o a a l s (s as X a Y) o o r a l s a l ar o s s. lso, o r oal o s r a l s ss o s, a o sol a a l s l o a as r r ral o s ss o or as o r r r a l la r a rs.

s r ors rar ly ass all ro a l a o a rs (r la o a a - o s, a r l r , o al y a o r y, a la o r ar ss s), y a r a o o o s l o or r . a s a rs ar - lar a o , r s a a ro o . or a l , a r 1 o o - o a o r r la o s o sol a a o s a as or o roso as . a r 20 o a r l r r s r l r s o so ar ro s. s ss o o al y a r 1 s r or a or r a r lar y a s oo r o .

Other New Topics and Revised Discussions

lo ro s s s ss , r ar a y o r r s o s. r ar so a l s.

- ***Part 1.*** *Cha e 1* a r olo y ro *ma e ial an o economic an* r s s ss o o o o o olo y, o s o s o . *Cha e 2* or a s o o a l a o s r a ly o sol a s o o o o sys s. *Cha e 3* ral a l s l r as a or o r s, soy- a a r r as a r or oo , r as s ly o r s r ro s o . *Cha e 4* a r l a ro o r s s o o o o o ral yo r o o o sol a o o a al s o s o o r, s ss o l ly or a aro a r r a r. *Cha e 5* r - s o y so r a o al o s (ra o s, r so r o s, or a o a olo y o s, a o y o s) s ss o o ro a s ss o o .
- ***Part 2.*** *Cha e 6* l a o r a r o a a l a o s o o ross las y o a r a s o o o r - o roll r s. *Cha e 7* a a l a o s a s o s o a la a ro *b dge e ain* o *b dge con ain* . *Cha e 8* ro la a o o l a l os s a l ar - y- o o l s o so r s o o o s o s al a l a o s o o o s o s al (s ar r s a s a rs). *Cha e 9* l s o o al a- o s o s or a r a a s s ss a a l la r a rs. *Cha e 10* , a a l s ro o s s a ally r s s o ss ss a ol y o s. *Cha e 11* r a ly s or - s ss o o ar ls y o s o o ly r , ra r a s or - al, a o s a s o r s s ss o o a ro , , o y o ally a r s. *Cha e 12* o so lo l s s o a l s a a a l s a a s o o o s r s r l s a ro r s r l s. *Cha e 13* ar a r y l a s ss o o s r al o ra o a s r al ol y a a l s o a - o s, l roso as r s s - o o s r al r la o or lar y a r l a o o ay's r la ory a r la ory l a r or a s ss o o so al r la o .
- ***Part 3.*** *Cha e 15* ra s os ra s r 1 - r s s ss o o a r 1 - s o s o a r als a ar s o r a or s ly s o la o r ar s, a a a s o o ra o . *Cha e 16* a s ss o o s l - a ro osal a a l a o o a o o o r . *Cha e 17* or a s ss o o o al y a r s o al y s ss o o al y o al .
- ***Part 4.*** *Cha e 18* s a l 1 -2 o os - a alys s ra s ss o o s a oll o ol s a alys s o a r al s a a r s o o lo al ar Glo al rs - 1 -1 o ar o o ss o s. *Cha e 19* r a a a a r a a a a s o o 2000 ral a r or . *Cha e 20* o- s a l 20-1 ro ar o la o o ar loy .

Internet Math Notes

l o os s s r l s o rs a o ly o s a s lls, a a a a a s ool o rs s a a s. or la r ro , s - al ra a , a as s, al l s o o s s ly r al a s l. or os s s, a l o o r s as o a o s. r y ro ssor rso , s o s ar r a , o s a o o . y o ly ll a a o al r or a - s s.

DISTINGUISHING FEATURES

s ra s a r o s s a r s.

- ***Comprehensive Explanations at an Appropriate Level.*** *Mic oeconomic* s o r s , a aly al, a all , y lly a ss l o a ra o s s. s oro ss a a ss l y a l s r ors o s l o - s or s al lassroo as s o a s s a r a a o r ly o r ass a r al oo .
- ***Fundamentals of the Market System.*** a y o o s ro o orl ar a l ra s o ro la o ar s. r a l s r - o o s o s a o ra o o *ma ke em* a r s or r l a a or . ay ar lar a o o ro r y r s, r r rs , r o o r r s a o , o o , a rol o ro s a s s o s ar oorly rs oo y s s.
- ***Early Integration of International Economics.*** r l s a s o s o lo al o o y arly r a . a r a s ro o orl ra , a or ar a s orl ra , s al a o a o ara a a a , or a ar , ar s a s s - s, a ar o s ra a r s. s s ro ro o o r a o al o o s r s lo al a o o la r ro o o s s ss o s.
- ***Early and Extensive Treatment of Government.*** Go r s a ral o o o o r a al s . s oo ro s o o - o s o o r arly a a or s sys a r a a r . a r 1 a s o r a ar a l r r r a l a a r 1 loo s a sal a s o l o ory a a a o .
- ***Stress on the Theory of the Firm and Technological Advance.*** a a o o ory o r a olo al a a . s o - s ar l or os s s oo r os o s s ally o o s l s y ra s or s o s a y a s r. a also o l a alys s o ar o s ar s r r s a s ss o o a o a ar arra o r , o l ls, r so r allo a o , a ra o olo al a a . o r a r 12 o ro o o s o olo y s o r l s oo s.
- ***Focus on Economic Issues.*** or a y s s, ro o o ss s ar r a o s. so o a a o alo lo al l s ro a l a o o a ro r a a aly al ools.

Flexible Organization and Content

Mic oeconomic r s all a s o sa o s ll l ly os or a ra s s. or s a , ory o r a ro o a r r a o ar ar lly r a . r , s l y s orr la o r - s ss, o r y.

r r s s s a r a a as o las y o a a s ly, ory o r , a r a o al o o s s sra l o o l a alys s ol y. G rally, s a r -s lo o a aly al ools (1) r al s r o s a ll s ra o s (2) r al a l s, a ( ) ra al r s a o as o s r al ll s ra o s.

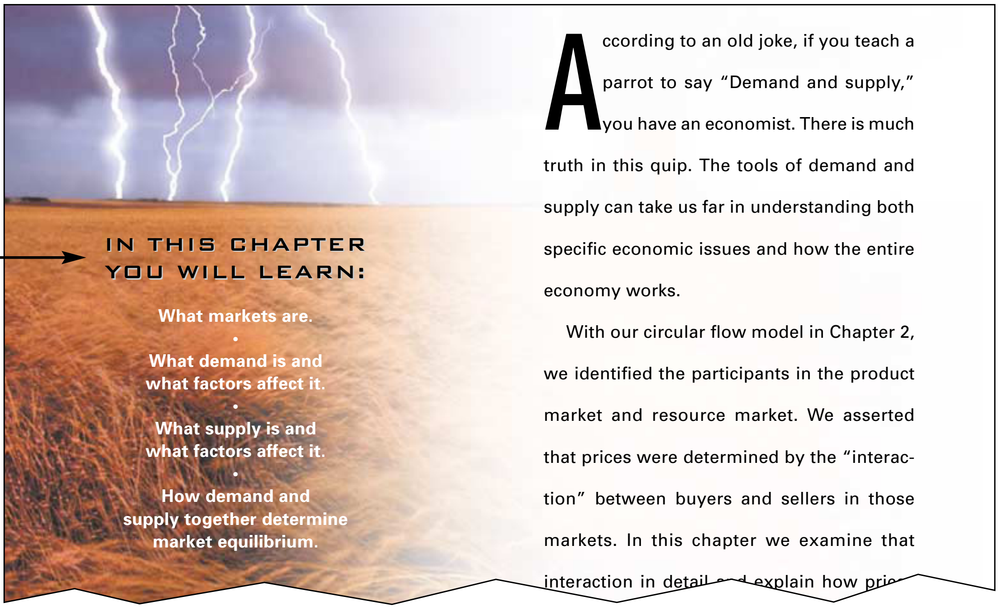
ll s o s ra o s a s s o or a oo o o r ar s ar 1 ro o o o o s a o o y ar 2 ro o o s o ro - ar s ar ro o o s o so r ar s a ar ro o- o s o Go r a l ol y.

l o s r ors rally a r as o o o r l s o ro o- o s o rs , y o r as o o o arra a r al. *Mic oeconomic* ro s o s ra l or a a o al l y. r o s s rs ll s y o s s a ally r arra a rs l l sa r o o y. o s r ors ll r r o rs rs ro o o s o ar s 2 a ro l s a rs o ar . or a l , a r 20 o a r l r ay ollo a r o r o o .

PEDAGOGICAL AIDS FOR STUDENTS

Mic oeconomic as al ays s or . o o s s o r - y a o l s oals s s o s. r or , o r s - so r ro ory o s o o o ro r y a r ra s.

- ***In This Chapter You Will Learn*** s o l ar o s a s ar o a a r so a r's a o s a as ly r o .

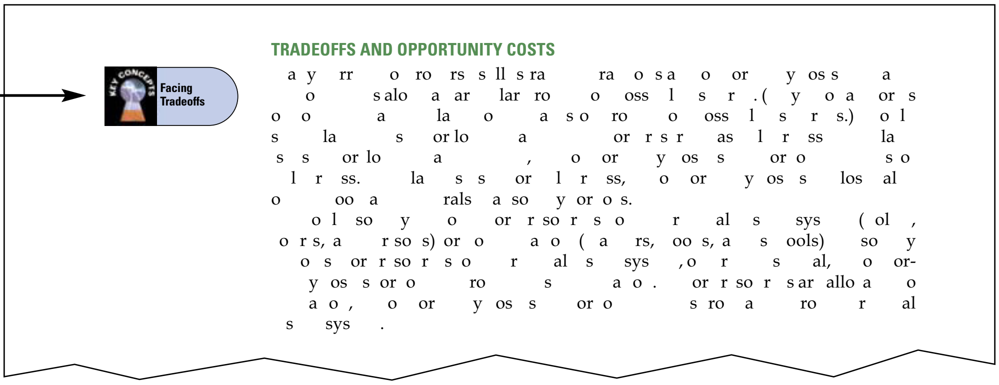


IN THIS CHAPTER YOU WILL LEARN:
What markets are.
What demand is and what factors affect it.
What supply is and what factors affect it.
How demand and supply together determine market equilibrium.

According to an old joke, if you teach a parrot to say "Demand and supply," you have an economist. There is much truth in this quip. The tools of demand and supply can take us far in understanding both specific economic issues and how the entire economy works.

With our circular flow model in Chapter 2, we identified the participants in the product market and resource market. We asserted that prices were determined by the "interaction" between buyers and sellers in those markets. In this chapter we examine that interaction in detail and explain how prices

- ***Web Links*** o s o ar a o o s r r s, a y r s ar ool r s s o s s a o a r a r al.
- ***Terminology*** s a or o o a y ro ory o rs s r olo y. s o y r s ar l ol y rs y a ar . y r s ar ar a a o r s l s a ars a o a a r. lossary o o s a also o a o oo a o s .
- ***Ten Key Concepts*** y o s a o l s s or a a r l s. y o s ar ro a - r l a ar r or ro o oo a o .



Facing Tradeoffs

TRADEOFFS AND OPPORTUNITY COSTS

a y rr o ro rs s ll s ra ra o s a o or y os s a o s alo a ar lar ro o oss l s r .(y o a or s o o a la o a s o ro o oss l s r s.) o l s la s or lo a or r s r as l r ss la s s or lo a , o or y os s or o s o l r ss. la s s or l r ss, o or y os s los al o oo a rals a so y or o s. o l so y o or r so r s o r al s sys (ol , o r s, a r so s) or o a o (a rs, oo s, a s ools) so y o s or r so r s o r al s sys , o r s al, o or- y os s or o ro s a o . or r so r s ar allo a o a o , o or y os s or o s ro a ro r al s sys .

- ***Data updates*** a o o s . ra ll. a/ oll / o ll or s l a l s a r s.

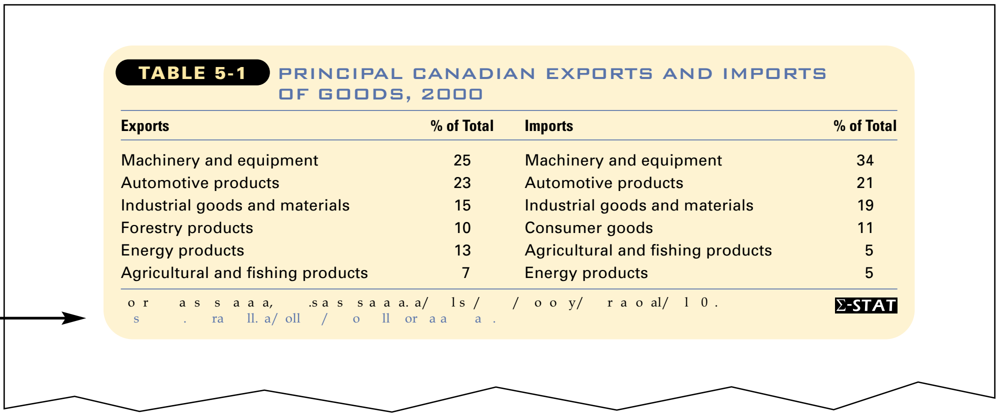


TABLE 5-1 PRINCIPAL CANADIAN EXPORTS AND IMPORTS OF GOODS, 2000

Exports	% of Total	Imports	% of Total
Machinery and equipment	25	Machinery and equipment	34
Automotive products	23	Automotive products	21
Industrial goods and materials	15	Industrial goods and materials	19
Forestry products	10	Consumer goods	11
Energy products	13	Agricultural and fishing products	5
Agricultural and fishing products	7	Energy products	5

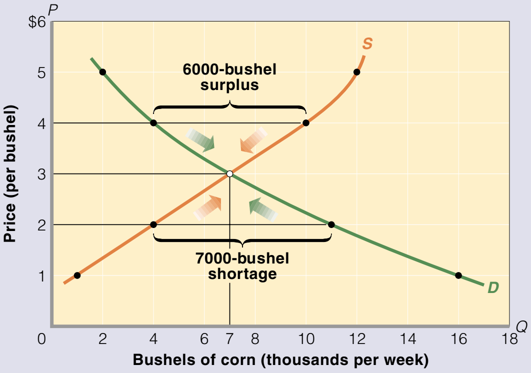
o r a s s a a a, .s a s s a a a. a/ l s / / o o y/ r a o al/ l 0 .
s . ra ll. a/ oll / o ll or a a a .

Σ-STAT

- *Key Graphs* a la ll ra s a s al r l a as **ey Graphs**. r s a o o r s o s r la o a y Gra , a s rs ro a o o o ra .

Key Graph **FIGURE 3-5** EQUILIBRIUM PRICE AND QUANTITY

The intersection of the downsloping demand curve *D* and the upsloping supply curve *S* indicates the equilibrium price and quantity, here $3 and 7000 bushels of corn. The shortages of corn at below-equilibrium prices (for example, 7000 bushels at $2), drive up price. These higher prices increase the quantity supplied and reduce the quantity demanded until equilibrium is achieved. The surpluses caused by above-equilibrium prices (for example, 6000 bushels at $4), push price down. As price drops, the quantity demanded rises and the quantity supplied falls until equilibrium is established. At the equilibrium price and quantity, there are neither shortages nor surpluses of corn.



QUICK QUIZ

1. **Demand curve *D* is downsloping because:**
   a. producers offer less product for sale as the price of the product falls.
   b. lower prices of a product create income and substitution effects, which lead consumers to purchase more of it.
   c. the larger the number of buyers in a market, the lower the product price.
   d. price and quantity demanded are directly (positively) related.

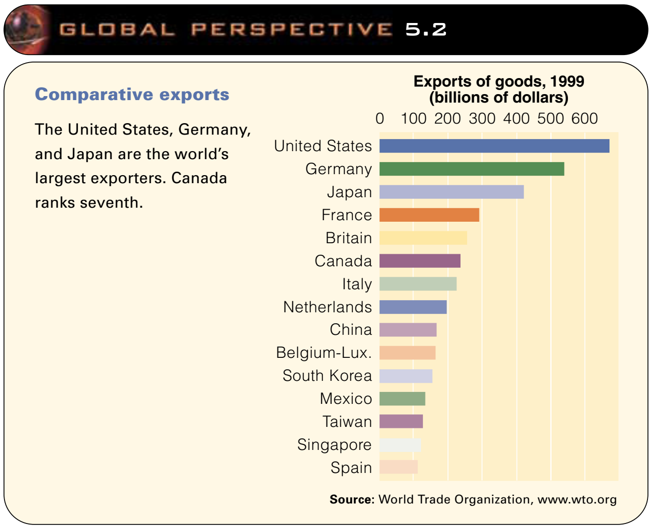
- *Interactive Graphs (Java Applets)* lo r s r s o o or-r s rso o a ra rs y, s ra a r s a or ra s a s r s s s o s r s, o s r o o s, a r r l a ral a o s. ors l y Gra s, a a l s ar a a la l o o ll s , . ra ll. a/ oll / o ll .

- *Reviewing the chapter* or a ss o l sa or a o . o ll a **Chapter Summary** a o l s o o ry a r as ll as o or r **uick Reviews** a a r. s r s a s ll l yo o o s o ss al as o a a r a also o s y or a s.

QUICK REVIEW

- The market system requires private ownership of property, freedom of enterprise, freedom of choice, and limited government.
- The market system permits economic entities—business, resource suppliers, and consumers—to pursue and further their self-interest. It prevents any single economic entity from dictating the prices of products or resources.
- The coordinating mechanism of the market system is a system of markets and prices.

- *Global Perspective boxes* a a o o s r as ly a lo al o o y. o a a r a o o s r o o ro , s r o a a loo a **Global Perspectives** a r s, o ar a a a o o r a o s.



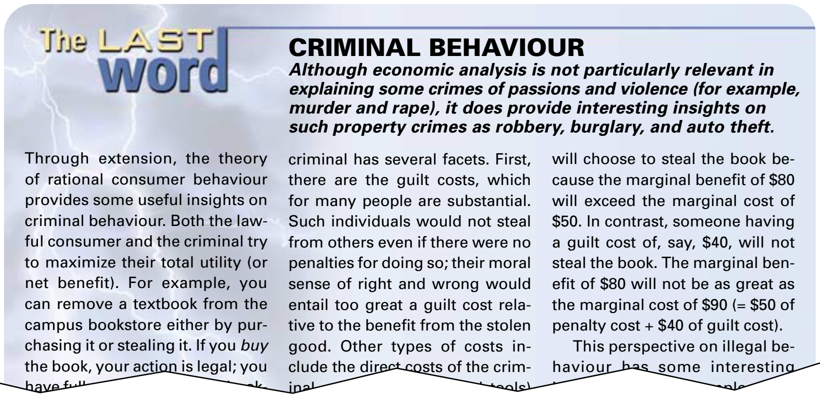
Comparative exports

The United States, Germany, and Japan are the world's largest exporters. Canada ranks seventh.

Source: World Trade Organization, www.wto.org

- *Appendix on graphs* o or a l ra al a alys s a a r la a a o s ll a a a a o s s r- s a r l s o o o s. a o a r 1, r s ra , l slo s, a l ar a o s, s o l o s .

- *New Last Words* o o o r o as or s ar a o rs a r s a a . o s ar r ar a l or a a- o al a l y o ar s (a r s a) ar or a or a s (a r s a 1 0) o o s o r al a o r (a - r s a 1) a os r al s o a a o ra s (a r 1 s a).


The LAST word

CRIMINAL BEHAVIOUR

Although economic analysis is not particularly relevant in explaining some crimes of passions and violence (for example, murder and rape), it does provide interesting insights on such property crimes as robbery, burglary, and auto theft.

Through extension, the theory of rational consumer behaviour provides some useful insights on criminal behaviour. Both the lawful consumer and the criminal try to maximize their total utility (or net benefit). For example, you can remove a textbook from the campus bookstore either by purchasing it or stealing it. If you *buy* the book, your action is legal; you

criminal has several facets. First, there are the guilt costs, which for many people are substantial. Such individuals would not steal from others even if there were no penalties for doing so; their moral sense of right and wrong would entail too great a guilt cost relative to the benefit from the stolen good. Other types of costs include the direct costs of the crim-

will choose to steal the book because the marginal benefit of $80 will exceed the marginal cost of $50. In contrast, someone having a guilt cost of, say, $40, will not steal the book. The marginal benefit of $80 will not be as great as the marginal cost of $90 (= $50 of penalty cost + $40 of guilt cost).

This perspective on illegal behaviour has some interesting

- ***Study Questions*** o r s ls o s o s s lo a a o a a r. ol l a yo l ar y o s ry r l a o o o s. s o s s o s ll a yo r rs a . s- a s ral o as y s o s a a s r y G .
- ***Internet Application Questions*** s ar r s s o s o lor o r r l a o o s ss a r. ro o ll s , . ra ll. a/ oll / o ll , s s ll r l s o s s l s s o s.

INTERNET APPLICATION QUESTIONS

1. Check out the *National Post* 500 list of the largest Canadian firms at <www.nationalpostbusiness.com/datamining/top500/top500.htm>. From the top ten profit list, select three firms from three different industries and discuss the likely sources of economies of scale that underlie their large size.
2. Use the Yahoo search engine at <www.yahoo.ca> to locate a company's homepage of your choice. Find and review the company's income statement in its annual report and classify the nonrevenue items as either fixed or variable costs. Are all costs clearly identifiable as either fixed or variable? What item would be considered as accounting profit? Would economic profit be higher or lower than this accounting profit?

- ***Origin of the Idea*** s r s or s, a o o s , r r y a y Gra o l oll a a or s o a or as oo . s ll r s o l ar a o rso o rs lo s as as o or y os s, - l r r , l l r, o ara a a a , a las y.

SUPPLEMENTS FOR INSTRUCTORS

- ***The Instructor Online Learning Centre*** (. ra ll. a/ oll / o ll) l s a ass or - ro s or s r ors. s o rs o loa a l s l s a a , Gra - ll y rso o rs s lo r .
- ***Instructor's Resource Manual*** o as ar ro, y rso rs y, as r s a a *In co ' Re o ce Man al.* l s a rs - ar s, l s s o a 's a a r, a s a s s o s, l ar o s, a r o l s, a a a s al a so r s s s- o s or lassroo s , a s o s a ro l s.
- ***Microsoft® PowerPoint® Slide Powernotes*** r ar y , G or a oll , s r s a o sys s o o s r or's - a o l ar r . o rs s al r s a o s a ay a a la o a ar lar o rs or a . y a s a ly r s or s o a o a a y a a ra s a r s a a or ro l.
- ***Test Bank 1*** r ar y ar ss ay a , o . rs y, s a l s or a 00 s o s a s a a la l r or a a l ro or a a o o s r or's - .

- lso a a la l ro . . s l l s ar
  - ***U.S. Test Bank II*** r y ll a als a , s s a o a s or a 200 s o s. ll s a s o s ar a or a or - o l l o l y asy, o ra , or l .
  - ***U.S. Test Bank III*** lso r ar y ll a als a , s s a o - a s o s r r s o s s o al a s rs a a a r r ro o o al l l - o a r - als s- o s. s a s rs o ssay a ro l s o s ar l .
- ***Instructor's Resource CD-ROM*** - o a s ry - s r or s or a l a l r
  - ***Electronic Instructor's Resource Manual*** a la l s o s a - rs o o a al. s r ors a r o or o s o a al's o s, o l r o a o s a al ra o s, or s as s a o s or a r ays y s . s a a l y l s r o a s rs o -o - a r s o s.
  - ***Microsoft® PowerPoint® Slide Presentation***
  - ***Computerized Test Bank*** ro s o lo a s ys o rs s s or *Mic oeconomic* a *Mac oeconomic* o - .
- ***CBC Video Cases*** o a y s a s r s o o s s r - ar y r o llo a orr s ars all, G or ro oll . o r ar o ro o o s a o r ar o a ro o o s, ra ro roa - as s o *Unde c en* , *The Na ional, C en Affai* , a *Ven e.* s os a os o a s s r la r al- orl o o ss s o , a o ll a y as a o s r s . s o s r or o s a o a s s s a ll a a la l a s r - or l ar r . o s s ll a a la l a or a or s lass a ro o-s r a o l ar r a ss l y o s r ors a s s.
- ***PageOut*** s . . o / a o o r a a a or yo r o rs s o r r so r s. a s Gra - ll y rso s lo r . s a ra o so ar s r o a o rs a s s o l a l y r a a o l o rs , o l ass s, s, l s or l a s s, l r o s, a or a a r o s.

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- a o , o ar r s ar also a a la l or o rs a a sys- s, s as a la oar . s la or s ro s r ors or s r r ly, l a ools. l as o a yo r lo al Gra - ll y rso sal s r r s a or a o al or a o .

www.blackboard.com

SUPPLEMENTS FOR STUDENTS

- ***Study Guide (ISBN#0-07-088670-9)*** or rs , a r rso o a- s a o al s a r oll , r s o o *S d G ide,* a y s s s sa l . a a r o a s a ro ory s a , a l s o a o ral o s, a o l , a l s o or a r s, ll- s o s, ro l s a ro s, o s- o s, a s ss o s o s. a s rs o o *Mac oeconomic '* a *Mic oeconomic '* -o- a r y s o s a ar a o orr- s o *S d G ide. G ide* o r s s a s r or a l or or r l s s .
- ***DiscoverEcon (ISBN# 0-07-246135-7)*** lo y rry lso a - rs y o ll o s- a a / r a a, *Di co e Econ* s a a la l a or- a or o s or os o r as a o . s - r so ar ro s s s a o l or al l o . a a r a r s o ssay s o s, ra ra s, a l l - o s a , a l s o lossary all o s ly o oo .
- ***Online Learning Centre*** r s s ll s l - ra s o s, r l a o s o s, o a l s, a s ro s or as s (r ar y orr s ars all o G or ro oll) all s o *Mic oeconomic* . or a - s , r ar **Internet Math otes,** lor or ly a a al a l o o s . or or or a o o l ar r , s a .)

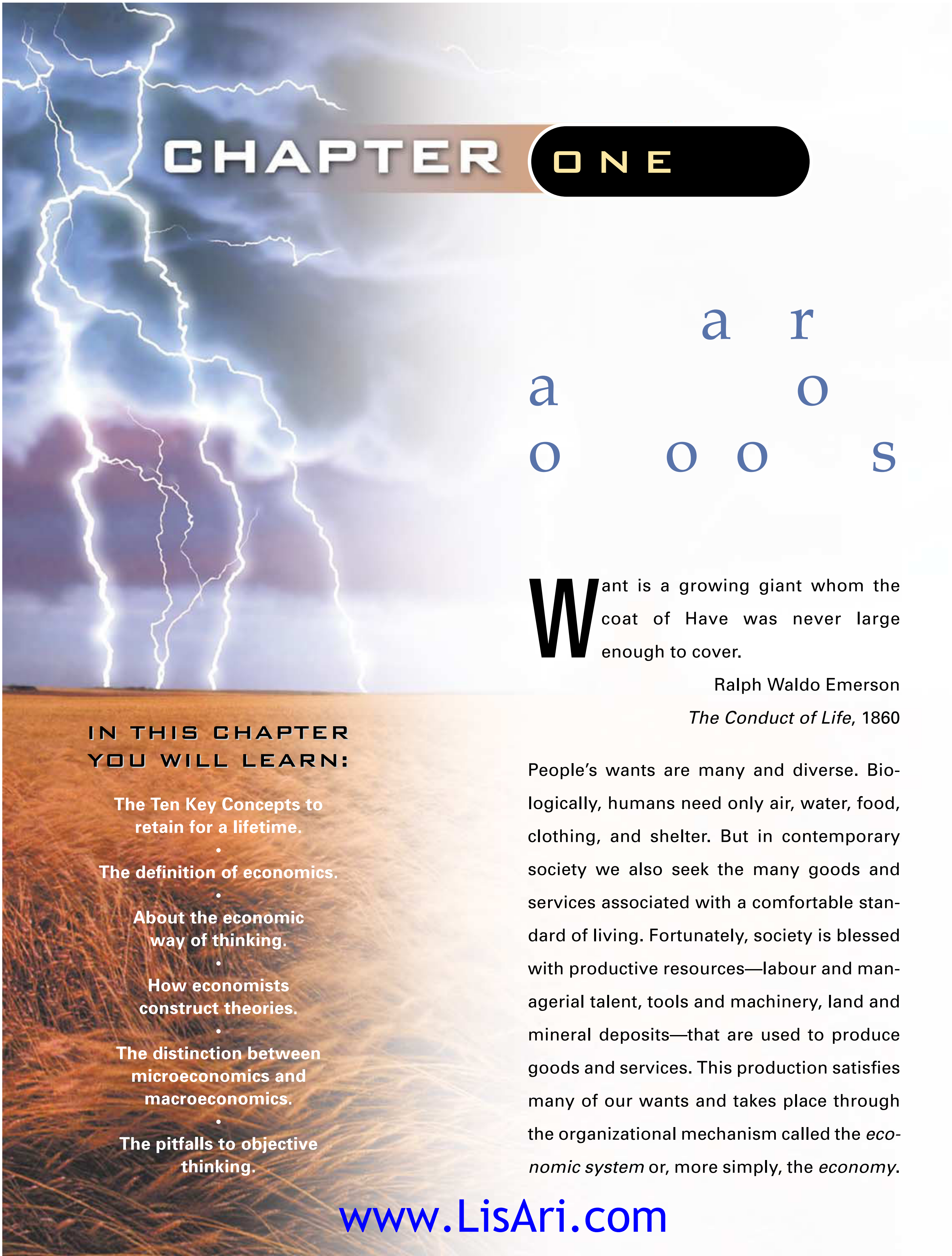
o l s

o as ro a ro r r s, r a r so r o s s o s or s r s o . rs l

r ar , . ary's rs y
orr s l a , rs y o as a a
al r al al , . ary's rs y
a ala s al, or al rs y
al o , rs y oll o ras r all y
rly a ro , rs y o a o a
or a ro , rs y o a o a
r a o s , a r oll
a o o aro, . ra s a r rs y
r o llo , G or ro oll
arl Gra a , ss o o y oll
G ral ooss , r o y oll
ar ss ay a , o . rs y
orr s ars all, G or ro oll
arl r, r s ol a s o olo y
ar , o ras r rs y
, G or a oll
a so , a la oll
arol r a, l o oll

s al a yo s o a a , y rso rs y, or s - la or s as al r r or . s y a a o o a l as o r r a ly o al y o al ro . also s al a s o rs o o r . . a o a r s . . o o *Economic* . ar r a ly o a y ro ss o als a Gra - ll y rso ar lar y s r, or o sor or o ol a , o o s or ar a , lo al or lly so , a a r, or al r s a lly y , ar a a r or r l s a ar r s . a a r a sa rla or r oro a s s - a a s o r oy r or s as or ll s ra o s. a a l lo r or s a olo r l o r. also s ro ly a o l Gra - ll y rso sal s s a , r s o ol ar s as .

Cam bell R. McConnell
S anle L. B e
Thoma Ba bie o



CHAPTER ONE

a r
a o
o o o s

> **W**ant is a growing giant whom the coat of Have was never large enough to cover.
>
> Ralph Waldo Emerson
>
> *The Conduct of Life*, 1860

IN THIS CHAPTER YOU WILL LEARN:

The Ten Key Concepts to retain for a lifetime.

•

The definition of economics.

•

About the economic way of thinking.

•

How economists construct theories.

•

The distinction between microeconomics and macroeconomics.

•

The pitfalls to objective thinking.

People's wants are many and diverse. Biologically, humans need only air, water, food, clothing, and shelter. But in contemporary society we also seek the many goods and services associated with a comfortable standard of living. Fortunately, society is blessed with productive resources—labour and managerial talent, tools and machinery, land and mineral deposits—that are used to produce goods and services. This production satisfies many of our wants and takes place through the organizational mechanism called the *economic system* or, more simply, the *economy*.

ECONOMICS The social science concerned with efficient use of scarce resources to achieve the maximum satisfaction of economic wants.

l r al y, o r, s a o r a s ar ro a a y o o r l r so r s. o o l sa s a o o so y's a s s os-s l . s a ro s o r o o **economics** *i i he ocial cience concerned ith he ef cien e of ca ce e o ce o achie e he ma im m a i fac ion of economic an* .

ro s ro l s a ss s ar s ro all o s l r so r s ly. l o s o l o , a sor o a aly-s s s a . s a r, o s ss so or a r l ar s.

TEN KEY CONCEPTS TO RETAIN FOR A LIFETIME

os yo ly yo r ro ory o o s ro ssor o s r or y ars a r yo o l s o rs . a ll yo a l o ll r yo r a ro o rs s a or a l ly yo ll o a l o r r ry . o l yo r a a as a o o s as o o r or a y y ars a r yo o l , a o **Ten ey Concepts** l ar ss al o rs a orl aro yo a l yo yo r os ar r. s y o s ll r or ro o oo . a y o s a o o s ss yo ll al r a o a o - s r o .

10 y o s ll s ly l s r la ora o o a o y o - s ll o as ro r ss ro oo . o o rs yo s o l r s 10 y o s. y ll l yo or a a r rs a a r als yo a s . a 10 y o s o r a or s (a) os r a o al ( ) o s a la ra o a o als a ( ) o s a al o o y as a ol a s a ar o l .

The Individual

Facing Tradeoffs

CO CEPT 1 (a ra o s) ar y r la o o a s a s yo a **tradeoffs** r or yo a o a o s.

Opportunity Costs

CO CEPT 2 (or y os s) os o o yo a s a yo or , or **opportunity cost**.

Choosing a Little More or Less

CO CEPT (oos a l or or ss) o s ar s ally a a **margin** oos a l l or or a l l l ss o so .

The Influence of Incentives

CO CEPT 4 (o s) o s yo a ar y **incentives**.

Interaction Among Individuals

Specialization and Trade

CO CEPT 5 (al a o a ra) **Specialization** a **trade** ll ro ll- o all ar a s.

The Effectiveness of Markets

CO CEPT 6 (ss o ar s) **Markets** s ally o a oo o o oor a ra a o als, ro s, a a o s.

The Role of Governments

CO CEPT 7 (ol o Go r s) **Governments** a o as o ally ro oor a o o ar s.

The Economy as a Whole and the Standard of Living

Production and the Standard of Living

CO CEPT 8 (ro o a a ar o) **standard of living** o a ra rso a ar lar o ry s o s ro o o oo s a s r s. r s s a ar o l r r s a r s o o oo s a s r s.

Money and Inflation

CO CEPT (o y a a o) o ary a or s o a o ry a - ally r o y ss o ro o o o oo s a s r s ll - ally l a o **inflation**.

Inflation-Unemployment Tradeoff

CO CEPT 10 (a o - loy ra o) s or r , so y a s a s or -r **tradeoff** **inflation** a s l l o **unemployment**.

s o s ll la ora o ro o s oo . s r o o loo o or o a al r s yo a o o s o s s s ss . o r oo r rs o , o o ay o .

THE ECONOMIC PERSPECTIVE

los yo r y s or a a r yo ar ara s , a la r yo a a a y yo a r yo s r . a ar lar ay yo ay yo a a a r o a s, a or a l o r, a ll lar o , s o s y , a a r rrar s or s ar o r s aro . o r r s ay a a o l ly r l s o a s, all o r s r s ll also sa s . , ryo ’s s r s ar sa s . ollo ay yo a s ar all o r a a a y r s yo a , a y ll all l ll . so ll o or r. o r o y ll r ol or s , yo ll a all r s a lo yo a , ., .

o rs , ara s ay a or s a rl , s orl o r a s r a ly o s r o r a l y o sa s y . y r s a s a o a s ar r a r a r so r s o os s r s, a a o- o ro l . s s r al y a s o o s s r rs . s **economic perspective** or *economic a of hinking* as s ral r al a los ly rr la a r s.

ECONOMIC PERSPECTIVE
A viewpoint that envisions individuals and institutions making rational decisions by comparing the marginal benefits and marginal costs associated with their actions.

Scarcity and Choice

Opportunity Costs

ro o r o o o o s, s asy o s y o o s s orl ro l s o s ar y. a a ro r y r so r s ar s ar (l -), ollo s a oo s a s r s ro s also l . ar y l s o ro o s a ss a s a a o s. a s a ’ a all, s a ll a , a a s or o.

r so r s a o o s s or a a r s o r l . o ay r a o l , a r o yo , r s a os o so o l a ly o so y. ar s o la , , ar la o r, la o r o oo s a a rs, a a a r al al ar r r . a s s r so r s o l s o r ro o a s, y a o r oo s a s r s y o l a ro ar sa r a l a a la l . o o s s all s sa r *s o o ni co* . o or o o , yo or o o or y o so ls . o, os o a yo s al o a s sa r o o a . ll say or a o o or- y os s a r 2.

Rational Behaviour

o o s s ro o ass o o ra o al s l - r s . als rs a o s a ll allo o a r r a s sa s a o . a o al a o r l s a als ll a r o s r r r- s a s. or a l , o s ay o y o a- ola l a a ar - o s s or ra r a a a o s or r s or s . a ll l a ra o y o y so ls a ro s sa s a - o . , l r o ro or , ay s o a o s or o y a s l a o o a- ola.

a o al s l - r s also l s a als ll a r o s. s ool ra a l ar ay o a oll or rs y o a or s - ss. a r ay o o a a o a a ar o s a y a ar. ay a a s o sa o r or s. ll r o s r rs o s l - r s a ar ra o al, y ar as o r r r s a r s a s. o rs , ra o al s o s ay a as os s a s a . o s ay s o s s o sal . , a r a a s ss o rs s, l ar ay o a r a or o so al or .

a o al s l - r s s o sa as s l s ss. o l a rso al sa r - s o l a ly rs or r s, a y o r o ar s a s y r l as r ro o so. ar s l ay or r l r ’s a o or sa r aso . s s l - r s , s l s , a s l a rs’ sa s a o as as a y rso al r as o oo s or s r s. l - r s a or ss ly a o r a a l s a rso o a rso al sa - s a o , o r a ay r .

Marginal Analysis: Benefits and Costs

MARGINAL ANALYSIS The comparison or marginal (“extra” or “additional”) benefits and marginal costs, usually for decision making.

KEY CONCEPTS Choosing a Little More or Less

o o rs o s s lar ly o **marginal analysis** o ar so s o *ma ginal bene* a *ma ginal co* . (s s ay, ar al a s ra, a o al, or a a .) os o s or s o s ol a s s a- s o (s s a o a a rs). o l yo a s ool or a o r y ar or o o l yo s y a ra o r or a a o l yo a r s o yo r as - oo or r larly, s o l a s ss a or r s o o l o - r r as or r as al ar

a o o ol s ar al s a , a s o s ar r so r s, ar al os s. a o s ra o ally, s o a r s o ar os o a o s. a l o a yo r a ar s o or a a r . o l yo y a ^{1}- ara a o , a $^{1}{}_{2}$- ara a o , a - ara a o , or a lar r o ar al os o lar r a o s a s yo s all r a o . ar al s r a r l l as r (l y) ro lar r s o . ar al o lar r a o s s ar- al os , yo s o l y lar r s o . ar al os s or a ar al , yo s o l y s all r a o s a .

a orl o s ar y, s o oo a ar al asso a so s o o al ays l s ar al os o or o so ls . o y s o lar r a o a s or o so ls . a , r s o r l !

s r r s l a o o s o s as o ar al a alys s s a r a oo o a oo . l o r a oo s a s r s s r- ly s ra l a o , al ar , a r s ro a a a oo o . oo o rs o a yo o r r ar al os (al o or o o o s) als r ar- al . ar sa r al r a ro s a ar or al a l *a he ma gin* la r o s r ry las s o a . o y a a oo al ar a yo a a oo a y r s. (***Key Question 1***) s a r's as or ro s a ry ay a l a o o o o rs .

QUICK REVIEW

- Economics is concerned with obtaining maximum satisfaction through the efficient use of scarce resources.
- The economic perspective stresses (a) resource scarcity and the necessity of making choices, (b) the assumption of rational behaviour, and (c) comparisons of marginal benefit and marginal cost.

ECONOMIC METHODOLOGY

SCIENTIFIC METHOD The systematic pursuit of knowledge through the formulation of a problem, collection of data, and the formulation and testing of hypotheses.

ys al a l s s, as ll as o r so al s , o o s r l s o **scientific method**. o s s s o a r o l s

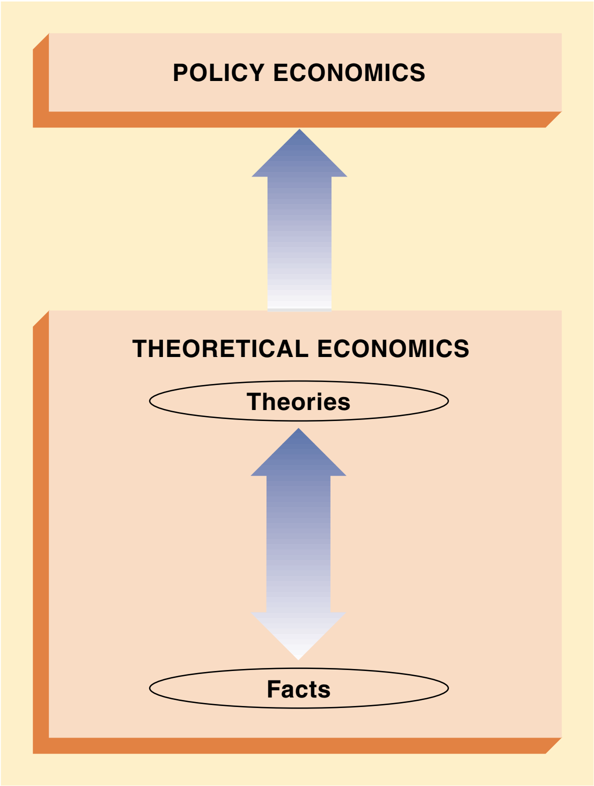
- o s r a o o a s (r al orl a a)
- as o os a s, or la o o oss l la a o s o a s a (y o s s).
- s o s la a o s y o ar o o s o s s o o o s r y y o s s.
- a a , r o , or o a o o y o s s, as o s o ar so s.
- o s o y o s s a a s a s. s a o ra l r s l s a la , y o s s ol o a *heo* , so s r rr o as a *model*. ry ll- s a ly a ory s r rr o as a *la* or *inci le*.

a s, r l s, a o ls a l o o s , l a ral s s , o rs a a la o o o a a o r ar o s o o s o ar lar a o s. as ll soo s , o o la s a r l s ar s - ally l ss r a a la s o ys s or s ry.

Deriving Theories

o o s s lo o ls o a o r o als (o s rs, or rs) a s o s (s ss, o r) a ro o , a , a o s o o oo s a s r s. y s ar y a r a s a o o o a y a o o o o s. a s orl s l r ra l rr la a s, o o s s, l all s s s, s s l s l or a o . y s r a s ar r l a o ro l r o s ra o . s sor ro ss s o l , r l a or a o ay a rs s ra o a r la . o o s ra s o a s o s a l s a s y o s s a o o- o a o r. y o s s ar s a a s r al orl o s r a o a

FIGURE 1-1 THE RELATIONSHIP BETWEEN FACTS, THEORIES, AND POLICIES IN ECONOMICS



Theoretical economics involves establishing economic theories by gathering, systematically arranging, and generalizing from facts. Economic theories are tested for validity against facts. Economists use these theories—the most reliable of which are called *laws* or *principles*—to explain and analyze the economy. *Policy economics* entails using the economic laws and principles to formulate economic policies.

THEORETICAL ECONOMICS The process of deriving and applying economic theories and principles.

a a. ro s ro ss, o o s r s o s o r y o s s a r s o l l o or s a r l s (or la s) ll- s a ly a - ral a o s a o o als a s o s a . ro ss o r or s a r l s s all **theoretical economics** (s lo r o r 1-1). *The ole of economic heo i ing i o ema icall a ange fac , in e e hem, and gene ali e f om hem.* or s a r l s r or r a a o a s y arra a s -a - or r.

s r a arro ro or s o a s r 1-1 o s o r o s. o rs a o a al, r al- orl s r r o or- la a l y o s s. y o s s ar s ro a r a or a a al a a o s y o s s a r .

PRINCIPLES Statements about economic behaviour that enable prediction of the probable effects of certain actions.

o o or s a **principles** *a e a emen abo economic beha io ha enable edic ion of he obable effec of ce ain ac ion* . Goo or s ar os a o a oo o o la a r . y ar s or y a s o r o als a s o s a ally a ro , a , a o s oo s a s r s. s a s ay a o r , so o o s s s o ally or s a a s s o o ro . ral o r o s r la o o o r l s ar or a o o .

TERMINOLOGY

o o sss a o y o s s, or s, o ls, la s, a r l s. o o s r so rla s ally r r o o - ral a o s. y o ss s al s a ory as s s or s a la or r l s a ory a as ro s ro r a a ra y, o r a o r. r olo y *economic la* a *inci le* ar s l, o y ly a r o a ss a rsal a l a o a s rar a y so al s . or *heo* s o s o o s o a y o l orr ly l or s a o o o r al- orl a l a o s. s oo , s o a o ll o r s o ory, la , r l , a o l. s, ll s r *la of demand* o s r r la o s r o a ro a a o o r as , ra r a ory or r l o a , s ly a s s s s o . ll r r o *ci c la o model,* o r lar o la , a s o ss ral as o a s l r r s a o .

GENERALIZATIONS

GENERALIZATION Statement of the nature of the relation between two or more sets of facts.

s a alr a y o , o o or s, r l s, a la s ar **generalizations** r la o o o a o r or o o o y s l . y ar r - s a s o o a s ar s ally rs o o als or s o s a a ly sa ay. *Economic inci le a e e e ed a he endencie of i- cal o a e age con me , o ke , o b ine m .* or a l , o o s s say a o s r s r s s rso al o r as s, y ar ll a ar a so o s ol s ay sa *all* o a r as r o s. , o a ra , a or r o o y, s o s o r as s. larly, o o ss la a o s rs y or o a ar lar ro s r alls. o o s rs ay r as r r as s y a lar a o , o rs y a s all a o , a a o a all. s r a y r l , o r, ol s or y al o s r a or o s rs as a ro .

"OTHER-THINGS-EQUAL" ASSUMPTION

OTHER-THINGS-EQUAL ASSUMPTION The assumption that factors other than those being considered are held constant.

o r s s s, o o ss s *ce e i a ib* or **other-things-equal assumption** o arr a r ral a o s. y ass a all o r ar a l s os r a o s ra o ar l o s a or a ar lar a alys s. or a l , o s r r la o s r o s a a o o r as . l s o ass a , o all a ors a - a o o s r as (or a l , r o s , r o o a- ola, a o s r o s a r r s), o ly r o s ar s. a o s o r o s r as s o s r la o s o o s y a s o r ar a l s.

a ral s s s s as s s or ys s s a s ally o o roll r s r all o r s ar a l o s a (or r ally so). y a s r a r s o ass r la o s o ar a l s. or a l , y a ro a o s ro a l o a s o ro . o o s s o a la ora ory s . o o ss s r or s s r al- orl a a, ar ra y a al o ra o o o o y. s o l ro , o r s *do* a . s lo o so s a s a s al s s o ol o r s al, o rol s l ss a r . s ar s l , o o or s ar l ss r a a l ss r s a os o la ora ory s s. a also a s y ar or o o a a a y s or s (or a l , la o ra y.)

ABSTRACTIONS

o o or s ar *ab ac ion* s l a o s a o rr l a a s a r- s a s. o o o ls o *no* rror ll o l y o r al orl . ry ro ss o sor o a a aly a s ol s s l a o a r o al o l r. or a ly, s a s ra o l a s so o l o o s r o o ory ra al a r al s . a s s ly o s s ! o o or s ar ra al r s ly a s y ar a s ra o s. ll s o o o- o r al y s l s oo o l o rs oo as a ol . o o s s a s ra a s, lo or s a l o ls o a o a o r- s o r l a o s a o a s. or or s r os s ly ra al.

GRAPHICAL EXPRESSION

a y o o o o ls s oo ar r ss ra ally os or a ar la ll *Ke G a h* . s r o r a a o s a r as a r o ra s.

Policy Economics

POLICY ECONOMICS
The formulation of courses of action to bring about desired economic outcomes or to prevent undesired occurrences.

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l o o s, or **policy economics** s a l a o o or s a a a o or la *olicie* a a o r sol a s o o ro l or r r a o- o oal. o o or s ar o a o o o o ol y, as s o r ar o r 1-1. o o ol y or ally s a l o ro l s a r y ar s . o r, o o a alys s a r so s ra l , s as loy , a o , or a r as o r y, ay oss l o a o or o ra a ro o o ol y. or a l , yo ay r a s a r a a o a a a as r r s ra s o r as s a r a r ss o .

FORMULATING ECONOMIC POLICY

r ar as s s ol y- a

- ***State the goal.*** rs s s o a a l ar s a o o o oal. say a a ll loy , o a a ryo , say, 1 a y ars o a s o l a a o r o a a ryo o *an* o or s o l a a o o l allo or so loy a s y a l a s s r r o s ry a or rs ol ar ly a o s oal s s .
- ***Determine the policy options.*** s s o or la al r a ol - s s o a oal, a r oss l s o a ol y. s r r s a a l ass ss o o o a , s, os s, a ol al as l y o al r a ol s. or a l , o a ll loy , s o l o r s s al ol y (ol s a o r s a a s), o ary ol y (a ls al r s ly o o y), a a o a ra ol y a a s or r loya l y, or a ol y o a s s s o r s a r sa - a a or rs

- *Implement and evaluate the policy that was selected.* r l ol y, o al a o ll or . ly ro as al - a o a ro o o o ol y. a s a a s or o y s ly al r l l o loy o r r - la o o a ar lar s ry (or a l , a) y l r - al r s l s o , y o a r ar l s s, a y o ol y al r o a or r (*Key Question 5*)

ECONOMIC GOALS

o o ol s ar s o a s o o oals, or o a r o oals a ar ly a a a a a a y o r o r s. y l

- *Economic growth* ro or a r oo s a s r s, or, or s - ly, lo a r s a ar o l .
- *Full employment* ro s a l o s or all s o ar ll a a l o or .
- *Economic efficiency* a l ll o a s s a a la l ro r so r s.
- *Price-level stability* o lar s s a o s s ral r l l a s, a o a o a a o .
- *Economic freedom* G ara a s ss s, or rs, a o s rs a a r o r o o o r o o a s.
- *Equitable distribution of income* s r a o ro o s a s o r y l os o rs oy a a .
- *Economic security* ro or os o ar ro ally ll, sa l , la o , a , or o r s a l o ar al l ls o o .
- *Balance of trade* a r aso a l o rall ala r s o orl r a o al ra a a al ra sa o s.

l o os o s a s oals as rally s a , also s- a r s s a ally o r s a s. a ar lar a s r l l a s a r o o o r o a s a a l s r - o o o o a as r r s ly s a s ra oals as o o r o s o s ar o s o s r l a . lso, so o s oals ar o l ary o s a , so o r o ll also r al . or a l , a ll loy a s l a - loy , s a as a s o a l o s r o . o r oals ay o or ally l s . y ay a l **tradeoffs**, a a o a o s sa r a o r. or a l , or s o al- s r o o o ay a s o or , s , o a , a a s ss r s s, all o ro o o o ro . a - o o l a ly a ra s rr a r s o lo - o o l s o ay o al s r o o o . s o - o - als ay s a s r a s r r r ar s or or . - larly, lo - o als ay l ss o a o or o r s a s r a y o s s . oals o , so y s lo a sys o r or o s s s. or o o r o s a o a y l ss o o s r y a

TRADEOFFS
The sacrifice of some or all of one economic goal, good, or service to achieve some other goal, good, or service.

Facing Tradeoffs

or o o s r y allo s l ss o o r o , so y s ass ss ra o s a o o al (s) ala .

QUICK REVIEW

- Economists use the scientific method to establish theories, laws, and principles. Economic theories (laws, principles, or models) are generalizations relating to the economic behaviour of individuals and institutions; good theories are grounded in facts.
- Theoretical economics involves formulating theories (or laws and principles) and using them to understand and explain economic behaviour and the economy; policy economics involves using the theories to fix economic problems or promote economic goals.
- Policy-making requires a clear statement of goals, a thorough assessment of options, and an unbiased evaluation of results.
- Some of society's economic goals are complementary, while others conflict; where conflicts exist, tradeoffs arise.

Macroeconomics and Microeconomics

o o ss r a a ly r l s a o o o a o r a o l ls.

Macroeconomics

MACROECONOMICS The part of economics concerned with the economy as a whole.

AGGREGATE A collection of specific economic units treated as if they were one unit.

Macroeconomics a s r o o y as a ol or s as s s o s or a r a s s as o r , o s ol , a s ss s ors. **aggregate** s a oll o o s o o s r a as y r o . r - or , l o r ll o s o o s rs a a a o o y a r a as y r o all o s rs. s a r a s, a ro o o ss s oo a a o r , or ral o - l , o s r r o o o y a r la o s s o s a or a r a s. a ro o o ss a s o s o o as r s as *o al* o , *o al* loy- , *o al* o , *agg ega e* r s, a *gene al* l l o r s a aly - ar o s o o ro l s. ry l l a o s o s s a ar o s a r a s. a ro o o s a s a , o sa , ro s, a s lls.

Microeconomics

MICROECONOMICS The part of economics concerned with such individual units as industries, firms, and households.

Microeconomics loo s a s o o s. s l l o a alys s, o s r a l s o a o o , or ry s all s o o o y, r ra ros o . ro o o s al o a al s- ry, r , or o s ol . as r r o a *eci c* ro , r o or rs loy y a *ingle* r , r or o o a *a ic la* r or o s ol , or r s o a *eci c* r , o r y, or a ly. ro o o s, a sa , ro s, a s lls, o a . a ro- ro s o o s o a a o o s s so ly o - ar al a ry o a r a ly la ll as r a ro or ro a y o s a s s o s o o o s ar roo o . a l l ro l o loy s s ally r a as a a ro o o o (a s loy r la s o *agg ega e s*), o o s s r o a - s o s a y *indi id al* or rs s ar or o s a ay *eci c* ro a la o r ar so ra ar also r al r loy ra . (*Key Question 7*)

Positive and Normative Economics

POSITIVE ECONOMICS
The analysis of facts or data to establish scientific generalizations about economic behaviour.

NORMATIVE ECONOMICS
The part of economics involving value judgments about what the economy should be like.

o a ro o o s a ro o o s ol a s, or s, a ol s. a o a s l so *o i i e* o o s a *no ma i e* o o s. **Positive economics** o s s o a s a a s -a - r la o s s. os o o s a o s al s, r s o s a l s s s a s a o o o a o r, a als a o o y s a ally l . a ally as a alys s s r al o oo ol y a alys s.

o ras **normative economics** or ora s al s a o a o o y s o l l . or a o o s loo s a s ra l y o r a as s o o o y. rl s r ss o s o s or or ar lar o o ol s.

os o o s o r s *ha i* , l or a o o s o ss - l s a o *ha o gh o be.* r ar so a l s. os s a loy ra s ral ro a a o s s r a a a a a. or a s a ro a a o so o r a ol s or r loy ra s. s o os s a r s al, o s s s a ally r as , oll a rs y rol ll all. or a s a - oll a rs y o s o l lo r so a or s s a o a a a o . r or ss as o or s o l a ar as - , r s a s ro a yo ar o r a or a s a . os o sa r a o o o s s ol s or a , al - as ol y s o s. o rs , r s o so sa r a o or s or o ls s r r s o o y a s ar s. o o s s a r o a ll ra o o o r l s. os o o o ro rsy s r s r o o s or al s a o a so y s o l l . (*Key Question 8*)

QUICK REVIEW

- Macroeconomics examines the economy as a whole; microeconomics focuses on specific units of the economy.
- Positive economics deals with factual statements (“what is”); normative economics involves value judgments (“what ought to be”). Theoretical economics is “positive”; policy economics is “normative.”

PITFALLS TO OBJECTIVE THINKING

a s yo a s so rso ally, o a l y o - ly a o o o ss s. r ar so o o alls o a o s ss- lly a ly o o rs .

Biases

os o l r a l o as s a r o o s a o o- o ss s. or a l , yo a or ora ro s ar ss or a l o y s al ays s r or o orro o y. r a s yo l a o r s ssar ly l ss a s ss s or a or o r- r la o s al ays r a l ss. as s lo a r r o a alys s. o o o ss s ll o s as s a r o o s a ar o s or y a s.

Loaded Terminology

o o r olo y s s a rs a o lar a a s s so - s o o ally as , or loa . r r or r s ro or s r- r s s ay a a a s o ro o or a a o r a ay sla a ar l a or ly. ro s ay la ll o s , lo a s ay all lo , or s l- r s a o r ay r . Go r or rs ay r rr o as l ss r a ra s, a os a o r s ro r o- r r la o s ay all so al s s. o o ly a aly o o ss s, yo s r ar o r or s o s r olo y.

Definitions

o o r s s o o s a r s al o s a ar r ro os l y r o o sa . s s rally o a ro l ryo rs a s s o s a s s o s s ly. or a l , *in e men* o a ra a s r as o s o s a o s s r y ar s, as so o s s ll a a a s o or o r o s. o o o s , *in e men* a s r as o ly r a r al (ys al) a - al ass s s as a ry a or o s r o o a a ory l- . o s o a r ly a al ra sa o o s a as or s r s.

Fallacy of Composition

FALLACY OF COMPOSITION Incorrectly reasoning that what is true for the individual (or part) is necessarily true for the group (or whole).

o r all o o s ass o a a s r or o al or ar o a ol s ssar ly r or a ro o als or ol . s s a lo al alla y all **fallacy of composition** ass o s *no* orr . s a a s al or a al or ar s *no* ssar ly al or lar r ro or ol .

o s r ollo a l ro o s o o o s. o ar a a oo all a a o a a s a o s a lay. , yo l a o yo r o a r . al s a yo , *an indi id al*, s a , yo r o a s ro . s s also r or ro or ryo a lay o ssar ly. *e e one* s a s o a lay, o o y l yo ll ro a ly a a r a all r a s a . s o a l o s ro o o s *indi id al* ar r o r a s a ar- larly lar ro s l ly o r al a s ar a o . s s a a - o ral o ar rs as a *g o* . al ar r's lar or r ro ll o o a ly (r) ro r s a s a ar r ro- s a l l ra o o o al ar o . or *all* ar rs as a ro , r s l o al o r as s. s, all ar rs r a r ro s, o al o o ar ro s ll r s , r ss ro r s. r l s ar r la ly lar , o al ar o a ally *fall*.

all o r arl r s o a ro o o s a ro o o s *The fallac of com o i ion emind ha gene ali a ion alid a one of he e le el of anal - i ma o ma no be alid a he o he .*

Causation Fallacies

a sa o s so s l o y o o s. o or a alla s o r r o o .

POST HOC FALLACY

POST HOC, ERGO PROPTER HOC FALLACY Incorrectly reasoning that when one event precedes another the first event must have caused the second event.

o s ry ar lly or o l a a s r s , s a s o . s o a l y r aso s o as *post hoc, ergo propter hoc* or **after this, therefore because of this fallacy**.

a l os a arly a s r a o a r r or s a s al a . or so la r r s a rass r r . a sa ly o - l a , a 's a , as a s , la s a 's r r o sly o . roos r ro s or a , a o s o a roos r s r s o s l or s r s !

ro ss o al oo all a r s a oa a a 's r or ro s. s oa a s ay . r a s r s o or r a al lay rs or a as r s l s r a s .

CORRELATION VERSUS CAUSATION

o o o s orr la o , or o o , a sa o . orr la o o s or o s s o a a a s o ly a y ar asso a so sys a a a l ay. or a l , ay a ar a l *X* r as s, *Y* also r as s. s orr la o o s o ssar ly a a r s a sa- o a a r as *X* s a s o a r as *Y*. r la o s o l r ly o al or o so o r a or, *Z*, o l a alys s.

r s a a l o o s s a o a os orr la o - a o a o . ral, o l or a o ar r o s a os l ss a o . o o s s s s s a o s a s a r o s ar or a o l s a or o l a l a ro or r, a s or rs r lar r salar s.

a sa o o l also ar ly r o r ay. o l r o s o l y or a o , s as y y or r r a s a s. r s ar o r la o s la a l s ll o r ays r a o a o orr - la a s ara r s s r r o s a o a l y a o - a o ar sa o s r r o a ro a ly a or r so, o l os ra s ll ro a ly o a or a o *and* ar r o s. r a r a o ll o sol a s o r o . (***Key Question 9***)

A LOOK AHEAD

as s a r ll o o s ar r o s as yo a a ro ar 1, r lo s o o r l s a o ls. ally, a r 2 ll l a o l o ro o o s a a o o y. a r lo la s o a a s ly a ll l yo rs a o r s a a so oo s a s r s ar s a l s ar s. a - r o all ar s o o y o s o *ma ke em* or s. a r a a ry or a s or o a a a o o y, r a o al s or.

The LAST word

FAST-FOOD LINES: AN ECONOMIC PERSPECTIVE

How can the economic perspective help us understand the behaviour of fast-food consumers?

You enter a fast-food restaurant. Do you immediately look to see which line is the shortest? What do you do when you are in the middle of a long line and a new serving station opens? Have you ever gone to a fast-food restaurant, seen very long lines, and then left? Have you ever become annoyed when someone in front of you in line placed an order that took a long time to fill?

The economic perspective is useful in analyzing the behaviour of fast-food customers. These consumers are at the restaurant because they expect the marginal benefit from the food they buy to match or exceed its marginal cost. When customers enter the restaurant, they go to the shortest line, believing that it will minimize their time cost of obtaining their food. They are acting purposefully; time is limited and people prefer using it in some way other than standing in line.

If one fast-food line is temporarily shorter than other lines, some people will move toward that line. These movers apparently view the time saving associated with the shorter line to exceed the cost of moving from their present line. The line switching tends to equalize line lengths. No further movement of customers between lines occurs once all lines are about equal.

Fast-food customers face another cost-benefit decision when a clerk opens a new station at the counter. Should they move to the new station or stay put? Those who shift to the new line decide that the time saving from the move exceeds the extra cost of physically moving. In so deciding, customers must also consider just how quickly they can get to the new station compared with others who may be contemplating the same move. (Those who hesitate in this situation are lost!)

Customers at the fast-food establishment do not have perfect information when they select lines. For example, they do not first survey those in the lines to determine what they are ordering before deciding which line to enter. There are two reasons for this. First, most customers would tell them "It's none of your business," and therefore no information would be forthcoming. Second, even if they could obtain the information, the amount of time necessary to get it (a cost) would most certainly exceed any time saving associated with finding the best line (the benefit). Because information is costly to obtain, fast-food patrons select lines without perfect information. Thus, not all decisions turn out as expected.

For example, you might enter a short line and find someone in front of you is ordering hamburgers and fries for 40 people in the Greyhound bus parked out back (and the employee is a trainee)! Nevertheless, at the time you made your decision, you thought it was optimal.

Imperfect information also explains why some people who arrive at a fast-food restaurant and observe long lines decide to leave. These people conclude that the marginal cost (monetary plus time costs) of obtaining the fast food is too large relative to the marginal benefit. They would not have come to the restaurant in the first place had they known the lines would be so long. But getting that information by, say, employing an advance scout with a cellular phone would cost more than the perceived benefit.

Finally, customers must decide what food to order when they arrive at the counter. In making their choices they again compare marginal costs and marginal benefits in attempting to obtain the greatest personal satisfaction or well-being for their expenditure.

Economists believe that what is true for the behaviour of customers at fast-food restaurants is true for economic behaviour in general. Faced with an array of choices, consumers, workers, and businesses rationally compare marginal costs and marginal benefits in making decisions.

CHAPTER SUMMARY

1. Economics is the study of the efficient use of scarce resources in the production of goods and services to satisfy the maximum satisfaction of economic wants.
2. The economic perspective includes three elements: scarcity and choice, rational behaviour, and marginalism. It sees individuals and institutions making rational decisions based on comparisons of marginal costs and marginal benefits.
3. Economists employ the scientific method in which they form and test hypotheses of cause-and-effect relationships to generate theories, laws, and principles.
4. Generalizations stated by economists are called principles, theories, laws, or models. Good theories explain real-world relationships and predict real-world outcomes.
5. Economic policy is designed to identify and solve problems to the greatest extent possible and at the least possible cost. This application of economics is called policy economics.
6. Our society accepts certain shared economic goals, including economic growth, full employment, economic efficiency, price-level stability, economic freedom, equity in the distribution of income, economic security, and a reasonable balance in international trade and finance. Some of these goals are complementary; others entail tradeoffs.
7. Macroeconomics looks at the economy as a whole or its major aggregates; microeconomics examines specific economic units or institutions.
8. Positive statements state facts (“what is”); normative statements express value judgments (“what ought to be”).
9. In studying economics we encounter such pitfalls as biases and preconceptions, unfamiliar or confusing terminology, the fallacy of composition, and the difficulty of establishing clear cause–effect relationships.

TERMS AND CONCEPTS

aggregate, p. 11
economic perspective, p. 4
economics, p. 3
fallacy of composition, p. 13
generalizations, p. 8
macroeconomics, p. 11
marginal analysis, p. 5
microeconomics, p. 11
normative economics, p. 12
“other-things-equal” assumption, p. 8
policy economics, p. 9
positive economics, p. 12
post hoc, ergo procter hoc fallacy, p. 14
principles, p. 7
scientific method, p. 6
theoretical economics, p. 7
tradeoffs, p. 10

STUDY QUESTIONS

1. KEY QUESTION Use the economic perspective to explain why someone who is normally a light eater at a standard restaurant may become a bit of a glutton at a buffet-style restaurant that charges a single price for all you can eat.
2. What is the scientific method and how does it relate to theoretical economics? What is the difference between a hypothesis and an economic law or principle?
3. Why is it significant that economics is not a laboratory science? What problems may be involved in deriving and applying economic principles?
4. Explain the following statements:
   - **a.** Good economic policy requires good economic theory.
   - **b.** Generalization and abstraction are nearly synonymous.
   - **c.** Facts serve to sort out good and bad hypotheses.
   - **d.** The *other things equal assumption* helps isolate key economic relationships.
5. KEY QUESTION Explain in detail the interrelationships between economic facts, theory, and policy. Critically evaluate this statement: “The trouble with economic theory is that it is not practical. It is detached from the real world.”

6. To what extent do you accept the eight economic goals stated and described in this chapter? What priorities do you assign to them?
7. KEY QUESTION Indicate whether each of the following statements applies to microeconomics or macroeconomics:
    - **a.** The unemployment rate in Canada was 6.5 percent in January 2001.
    - **b.** The Alpo dog food plant in Bowser, Alberta, laid off 15 workers last month.
    - **c.** An unexpected freeze in central Florida reduced the citrus crop and caused the price of oranges to rise.
    - **d.** Canadian output, adjusted for inflation, grew by 4.7 percent in 2000.
    - **e.** Last week the Royal Bank lowered its interest rate on business loans by one-half of 1 percentage point.
    - **f.** The consumer price index rose by 2.7 percent in 2000.
8. KEY QUESTION Identify each of the following as either a positive or a normative statement:
    - **a.** The high temperature today was 30 degrees.
    - **b.** It was too hot today.
    - **c.** Other things equal, higher interest rates reduce the total amount of borrowing.
    - **d.** Interest rates are too high.
9. KEY QUESTION Explain and give an example of (a) the fallacy of composition, and (b) the "after this, therefore because of this" fallacy. Why are cause-and-effect relationships difficult to isolate in economics?
10. Suppose studies show that students who study more hours receive higher grades. Does this relationship guarantee that any particular student who studies longer will get higher grades?
11. Studies indicate that married men on average earn more income than unmarried men of the same age. Why must we be cautious in concluding that marriage is the *cause* and higher income is the *effect*?
12. **(Last Word)** Use the economic perspective to explain the behaviour of the *workers* (rather than the customers) observed at a fast-food restaurant. Why are these workers there, rather than, say, cruising around in their cars? Why do they work so diligently? Why do so many of them quit these jobs once they have graduated high school?

INTERNET APPLICATION QUESTIONS

Σ-STAT

1. **Three Economic Goals—Are They Being Achieved?** Three primary economic goals are economic growth (an increase in real GDP), full employment (less than 7 percent unemployment), and price-level stability (less than 2 percent as measured by the Consumer Price Index—CPI). Statistics Canada www.statcan.ca/english/Pgdb/Economy/econom.htm provides links to Canadian economic data. Visit their links for Output, Income, Expenditures (under National accounts), Prices and Employment, and Unemployment (Labour markets) to assess whether these three goals are being met in Canada.
2. **Normative Economics—Canadian Politics.** Many economic policy statements made by the Liberal Party www.liberal.ca, the Reform Party www.reform.ca, the Progressive Conservative Party www.pcparty.ca, and the NDP www.ndp.ca can be considered normative rather than positive economic statements. Visit their Web sites and compare and contrast their views on how to achieve economic goals. How much of the disagreement is based on positive statements and how much on normative statements? Give an example of loaded terminology from each site.

o

a r 1

GRAPHS AND THEIR MEANING

yo la ly ro s , yo ll a y ra s. o s s - l , l o rs s or o l a . ll ar or a . y ar l o l yo s al a rs a o o r la o s s. ys s s a s s so s ll s ra r or s y l arra s o l olo r oo alls, r r s ro o s, ro s, a l ro s, ar l ro r r la o o o a o r y r s or s s. o o s s os o s ra s o ll s ra r o ls. y rs a s r s, yo a or r a ly o r o o r la o s s. os o o r r l s or o ls la r la- o s s s o s s o o o a s, a o ly r - r s o- s o al ra s.

Construction of a Graph

HORIZONTAL AXIS The “left-right” or “west-east” axis on a graph or grid.

VERTICAL AXIS The “up-down” or “north-south” axis on a graph or grid.

ra s a s al r r s a o o r la o s o ar a l s. a l 1-1 s a y o al ll s ra o s o r la o s o a o s o or o o y as a ol . o s y o o s, o l ly a o l o l y or oo s a s r s r o s o . s ar o s r r s o a l 1-1 a o al o - s o o o y r as s as o al o r as s. or a o a l 1-1 s r ss ra ally r 1-1. r s o s o a o s o s ally or ra ally o o s o a s as o a s. o s r a or, r r s o **horizontal axis** o ra , as s s o ary. a s o s o s o o , r r s o **vertical axis** o ra , as s also s o ary. ally, a ar o s r r s *inde enden a iable* o or o al a s a *de enden a iable* o r al a s. o arra r al a or o al s al s o ra o r ra s o al s o o s o a o , a ar s al s o r s. s yo a s , al s ar o s al s o r all al s a l 1-1. r s o o s al s ar $100 or a ro a ly a 1.2 r s.

TABLE A1-1 THE RELATIONSHIP BETWEEN INCOME AND CONSUMPTION

Income per week	Consumption per week	Point
$ 0	$ 50	*a*
100	100	*b*
200	150	*c*
300	200	*d*
400	250	*e*

a s ra as o s o s, a o r r s s a o al a s asso a o s o al . o a o a r r s s o o o - o s o o a o s a l 1-1, ra r lars ro a ro r a al s o r al a or o al a s. or a l , o lo o *c* ($200 o $1 0 o s o o), r lars ar ra ro or o al (o) a s a $200 a a ross ro r al (o s o) a s a $1 0. s r lars rs a o *c,* r r s s s ar lar o o s o o a o . o s o l r y a o r o o - s o o a o s s o a l 1-1 ar ro rly lo a r 1-1. ally, y ass a sa ral r la o s o a o - s o r a ls or all o r o s, ra a l or s oo r o o s o s. a l or r r r s s o o s o r la o s . ra s a s ra l , as r 1-1, say r la o s s *linea* .

Direct and Inverse Relationships

l r 1-1 slo s ar o r , so s a r r la o s o a o s o . y a **direct relationship** (or os r la o - s) a a o ar a l s s as , o s o a o a *ame* r o . r as o s o s asso a a r as o a r as o s o a o a s a r as o . o s s o a a ar os ly or r ly r la , y al ays ra as a *lo ing* l , as r 1-1.

o ras , o s s o a a ay rs ly r la . o s r a l 1-2, s o s r la o s r o as all s a a a a a or rs y ( ). r a a **inverse relationship** (or a r la- o s) a s o ar a l s a *o o i e* r o s. r s r as , a a r as s. r s r as , a a r as s. s a a o s a l 1-2 ar lo r 1-2. s r a a rs r la o - s al ays ra s as a *do n lo ing* l .

Dependent and Independent Variables

l o s o al ays asy, o o s s s o r ar a l s a s a s . r, or or ally, y s ar a l a - ar a l . **independent variable** s a s or so r s ar a l a a s rs . **dependent variable** s or o o s ar a l a a s a s o a ar a l . s o o r o o s o a l , o rally s ar a l a o s o ar a l . o a s s o s o o a s ra r a o r ay aro . larly, r s (s a a o s aso) r a a a as all a s a a a a s o s o r

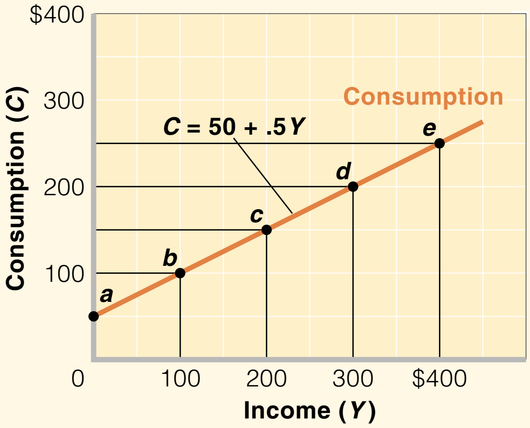
DIRECT RELATIONSHIP The (positive) relationship between two variables that change in the same direction, for example, product price and quantity supplied.

INVERSE RELATIONSHIP The (negative) relationship between two variables that change in opposite directions, for example, product price and quantity demanded.

INDEPENDENT VARIABLE The variable causing a change in some other (dependent) variable.

DEPENDENT VARIABLE A variable that changes as a consequence of a change in some other (independent) variable; the "effect" or outcome.

FIGURE A1-1 GRAPHING THE DIRECT RELATIONSHIP BETWEEN CONSUMPTION AND INCOME



Two sets of data that are positively or directly related, such as consumption and income, graph as an upsloping line.

TABLE A1-2 THE RELATIONSHIP BETWEEN TICKET PRICES AND ATTENDANCE

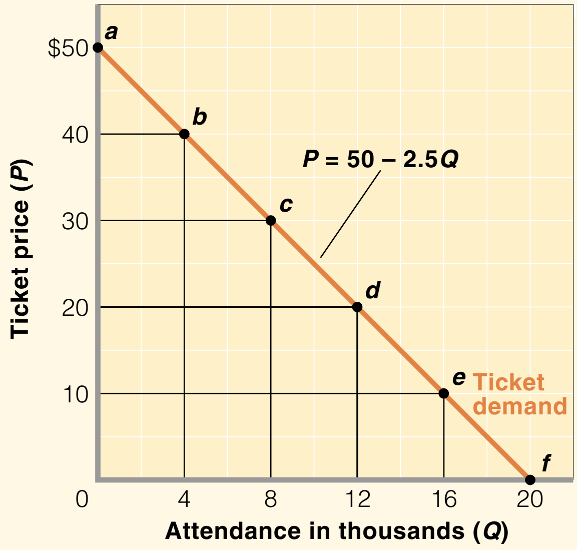
Ticket price	Attendance, thousands	Point
$50	0	*a*
40	4	*b*
30	8	*c*
20	12	*d*
10	16	*e*
0	20	*f*

r s or os a s. r s ar a l , a a y o - s r as s ar a l . o ay r all ro yo r s ool o rs s a a a a s al ays - ar a l (a s) o or o al a s a ar a l ( ) o r al a s. o o s s ar l ss y r ra o a ar a l s s or ar rary. r o o al ra o o o s o r la o s s o s s a a al r s a o , o o s s r a os a a o r al a s. , o o s s ra o 's r - a a a a o s or al a - a al ro r .

Other Things Equal

r s l o- ar a l ra s r os ly or a y o r a ors a a a o o o s o o rr a a o l l or r o o l o a as all a s a a oss l r . o o- s s lo r la o s a y o ar a l s, y loy *ce e i a ib* (o r s al) ass o . s, r 1-1 all a ors o r a o a a a o o o s o ar r s o o s a or a . larly, r 1-2 all a ors o r a r a a a a as all a s ar ass o s a . r al y, o r s ar o al yo a , a y o, r la o s r r s o r o a l s a ra s ll a . ally, l s a lo o l s o lo a o s. o s r a s o ar ras . ra- a ro al o s o s a s o l o l l ss al y a r or l ss ll o o s a a l lo o . r s l a o ar s o o - s o l . o s s, yo s o l lo a o s o l r 1-1, ass a o s o s, say, $20 l ss a a o l l. o a r la o s r a s r l r ly s s o ar o r l l ss o s o s a a o l l. larly, a ors o r a r s a a a a . los s os o s a s, a a a a s

FIGURE A1-2 GRAPHING THE INVERSE RELATIONSHIP BETWEEN TICKET PRICES AND GAME ATTENDANCE



Two sets of data that are negatively or inversely related, such as ticket price and the attendance at basketball games, graph as a downsloping line.

l ss a a r . o s s, r ra r 1-2, ass a 2000 r a s a a s a a r . (*Key Appendix Question 2*)

Slope of a Line

s a s r r s o r slo s a r r s. **slope of a straight line** s ra o o r al a (r s or ro) o or o al a (r) a y o o s o l , or r s o r r .

SLOPE OF A LINE The ratio of the vertical change (the rise or fall) to the horizontal change (the run) between any two points on a line. The slope of an upward sloping line is positive, reflecting a direct relationship between two variables; the slope of a downward sloping line is negative, reflecting an inverse relationship between two variables.

POSITIVE SLOPE

o *b* a o *c* r 1-1 r s or r al a (a o s o) s +$ 0 a r or or o al a (a o) s +$100. r or

$$\text{lo} \quad \frac{\text{r al a}}{\text{or o al a}} \quad \frac{+\ 0}{+100} \quad \frac{1}{2}\ .$$

o a o r slo o $^{1}{}_{2}$ or . s os a s o s o a o a sa r o a s, o s o a o ar r ly or os ly r la .

slo o . lls s r ll a $1 r as o s o or ry $2 r as o . larly, a s a or ry $2 r as o r ll a $1 r as o s o .

NEGATIVE SLOPE

a y oo o s r 1-2, say, o *c* a o *d*, r al a s 10 (ro) a or o al a s + (r). r or

$$\text{lo} \quad \frac{\text{r al a}}{\text{or o al a}} \quad \frac{10}{+} \quad 2^{1}{}_{2} \quad 2.$$

s slo s a a s r a a a a a rs or a- r la o s .

o a o or o al a s a a s s a o sa s o o l . o slo o 10/+ or 2. a s a lo r r y $10 ll r as a - a y 000 o l . s s sa as say a a $2. 0 r r o ll r as a a y 1000 rso s.

SLOPES AND MEASUREMENT UNITS

slo o a l ll a y o o s or r ar a l . , o r r ll s ra o , a os o as r a a al o l , o r or o al a o l a 000 a slo o l a

$$\text{lo} \quad \frac{10}{+\ 000} \quad \frac{1}{+\ 00} \quad .002$$

slo s o ay r l a ar a l s ar as r .

SLOPES AND MARGINAL ANALYSIS

all a o o s s lar ly o r a s ro s a s o. o o slo s or a o o s a s r s ar al a s os ol o or (or o l ss) . or a l , r 1-1 . slo s o s a $. 0 o ra or ar al o s o s asso a a $1 a o . s a l , o l oll ly ll o s $. 0 o a y $1 r as r o s a r r o s o y $. 0 or a $1 l o .

INFINITE AND ZERO SLOPES

a y ar a l s ar r la or o o a o r. or a l , a - y o r s a s r as s o r la o r o a a as. r 1- (a) r r s r o a a as o r al a s a a y o a s a o or o al a s. ra o r r la o s s l arall l o r al a s, a a sa a y o a s s r- as o a r a r o a a as. slo o s a l s *in ni e.* larly, a r a o s o s o l ly r la o a o ’s or ra . r 1- ( ) o s o o r al a s a or ra o or o al a s. l arall l o or o al a s r r s s s la o r la ss. s l as a slo o *e o.*

Vertical Intercept

VERTICAL INTERCEPT The point at which a line meets the vertical axis of a graph.

l a lo a o a ra (o lo o s) o s slo a s r al r . **vertical intercept** o a l s o r l s r al a s. r 1-1 r s $ 0. s r a s a r- r o r ro, o s rs o l s ll s $ 0. y o s ro orro or y s ll so o r ass s. larly, $ 0 r al r- r 1-2 s o s a a a $ 0 r , ’s as all a o l lay a y ar a.

Equation of a Linear Relationship

o r al r a slo , a s r a l s ly a o or . s ral or , a o o a s ra l s

$$a + b$$

r ar a l

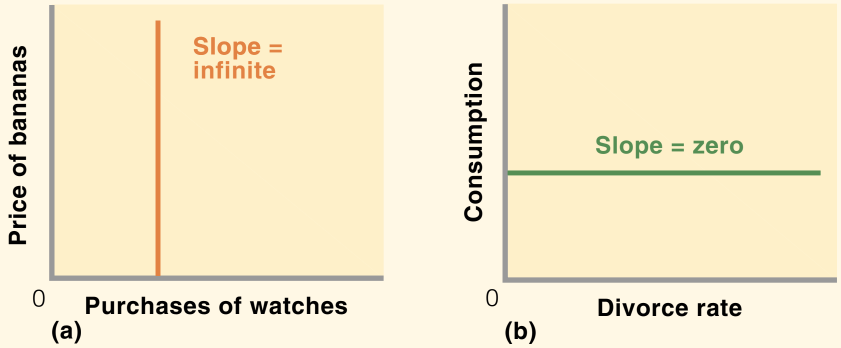
a r al r

b slo o l

ar a l

FIGURE A1-3 INFINITE AND ZERO SLOPES

(a) A line parallel to the vertical axis has an infinite slope. Here, purchases of watches remain the same no matter what happens to the price of bananas. (b) A line parallel to the horizontal axis has a slope of zero. Here, consumption remains the same no matter what happens to the divorce rate. In both (a) and (b), the two variables are totally unrelated to one another.



oro r o -o s o a l , Cr r s s o s o (ar a l) a Yr r s s o (ar a l), a r C a + bY. y s s o al s o r a slo ,

C 0 + . Y

s a o also allo s s o r a o o o s o C a a y s - l lo o . o s o l s o o r a a $2 0 o l l, o - s o s $1 .

o o s s r rs a a al o o y ar a l o r al a s a ar a l o or o al a s, s a s or ar a l , ra r a ar a l ral or . o r o sly a s as s r l a or o r r - a a a a. P r r s s r (ar a l) a Q r - r s s a a (ar a l), r r la o s s y

P 0 2. Q

r r al r s 0 a a slo s 2¹ ₂ or 2. . o al o P l s s sol or Q, o r ar a l . o s o l s s a o o r sal s r s $1 . (*Key Appendix Question 3*)

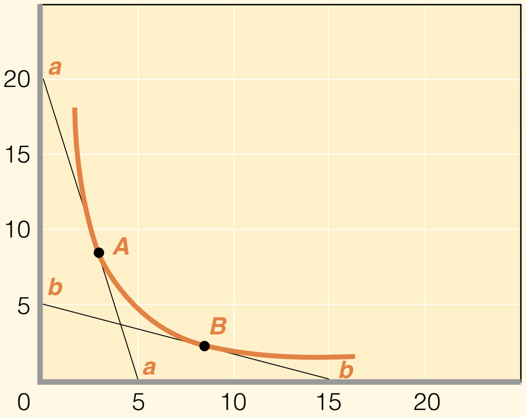
Slope of a Nonlinear Curve

o o ro s l orl o l ar r la o s s (s ra l s) o or o l orl o o l ar r la o s s. slo o a s ra l s sa a all s o s. slo o a l r r s a o l ar r la o s a s ro o o o a o r. l s ar r rr o as *c e* . (s also r- ss l o r r o a s ra l as a r .) o s r o slo r r 1- . s slo s a ro o , r a s as o o alo . s, s slo o s a ly a s r as a r slo a a o .

o as r slo a a s o , ra a s ra l a o r a a o . l s *angen* a a o o s, o s o rs , r a a o . s l *aa* s a o r r 1- a o A. slo o r a a o s al o slo o a l . ally, o al r al a (ro) a l *aa* s 20 a o al or o - al a (r) s + . a s slo o a l *aa* s 20/+ , or , slo o r a o A s also .

bb r 1- s a o r a o B. ollo sa ro r , slo a B o /+1 , or 1/ . s, s a r ar o r , slo s l ss a . (*Key Appendix Question 6*)

FIGURE A1-4 DETERMINING THE SLOPES OF CURVES



The slope of a nonlinear curve changes from point to point on the curve. The slope at any point (say, *B*) can be determined by drawing a straight line that is tangent to that point (line *bb*) and calculating the slope of that line.

APPENDIX SUMMARY

1. Graphs are a convenient and revealing way to represent economic relationships.
2. Two variables are positively or directly related when their values change in the same direction. The line (curve) representing two directly related variables slopes upward.
3. Two variables are negatively or inversely related when their values change in opposite directions. The curve representing two inversely related variables slopes downward.
4. The value of the dependent variable (the "effect") is determined by the value of the independent variable (the "cause").
5. When the "other factors" that might affect a two-variable relationship are allowed to change, the graph of the relationship will likely shift to a new location.
6. The slope of a straight line is the ratio of the vertical change to the horizontal change between any two points. The slope of an upsloping line is positive; the slope of a downsloping line is negative.
7. The slope of a line or curve depends on the units used in measuring the variables. It is especially relevant for economics because it measures marginal changes.
8. The slope of a horizontal line is zero; the slope of a vertical line is infinite.
9. The vertical intercept and slope of a line determine its location; they are used in expressing the line—and the relationship between the two variables—as an equation.
10. The slope of a curve at any point is determined by calculating the slope of a straight-line tangent to the curve at that point.

APPENDIX TERMS AND CONCEPTS

dependent variable, p. 19
direct relationship, p. 19
horizontal axis, p. 18
independent variable, p. 19
inverse relationship, p. 19
slope of a line, p. 21
vertical axis, p. 18
vertical intercept, p. 22

APPENDIX STUDY QUESTIONS

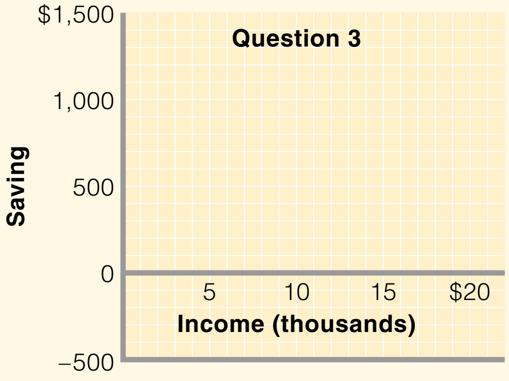
1. Briefly explain the use of graphs as a way to represent economic relationships. What is an inverse relationship? How does it graph? What is a direct relationship? How does it graph? Graph and explain the relationships you would expect to find between (a) the number of centimetres of rainfall per month and the sale of umbrellas, (b) the amount of tuition and the level of enrolment at a college or university, and (c) the popularity of a music artist and the price of her concert tickets.

   In each case cite and explain how variables other than those specifically mentioned might upset the expected relationship. Is your graph in part b, above, consistent with the fact that, historically, enrolments and tuition have both increased? If not, explain any difference.

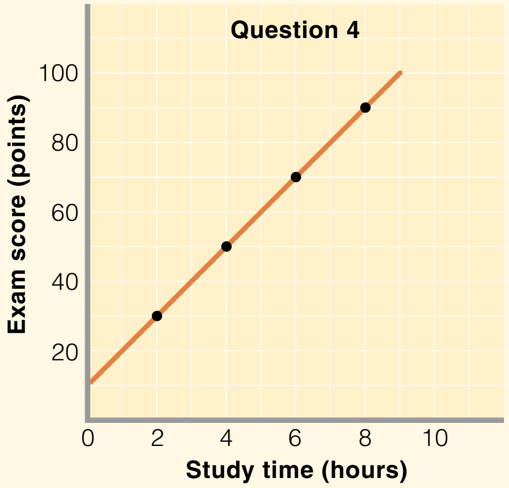
2. **KEY APPENDIX QUESTION** Indicate how each of the following might affect the data shown in Table A1-2 and Figure A1-2 of this appendix:
   - **a.** IU's athletic director schedules higher-quality opponents.
   - **b.** An NBA team locates in the city where IU also plays.
   - **c.** IU contracts to have all its home games televised.

3. **KEY APPENDIX QUESTION** The following table contains data on the relationship between saving and income. Rearrange these data into a meaningful order and graph them on the accompanying grid. What is the slope of the line? The vertical intercept? Interpret the meaning of both the slope and the intercept. Write the equation that represents this line. What would you predict saving to be at the $12,500 level of income?

Income (per year)	Saving (per year)
$15,000	$1,000
0	–500
10,000	500
5,000	0
20,000	1,500

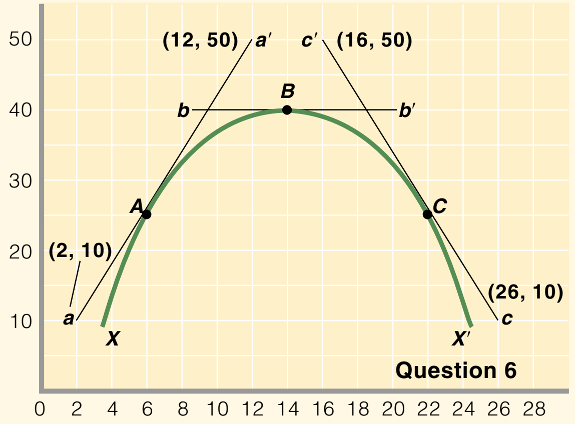


4. Construct a table from the data shown on the graph below. Which is the dependent variable and which the independent variable? Summarize the data in equation form.

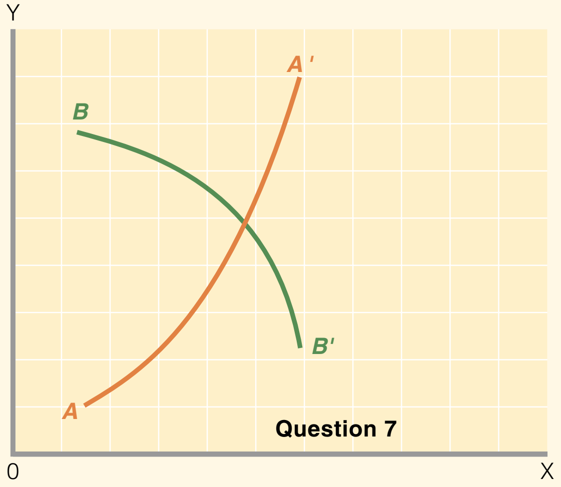


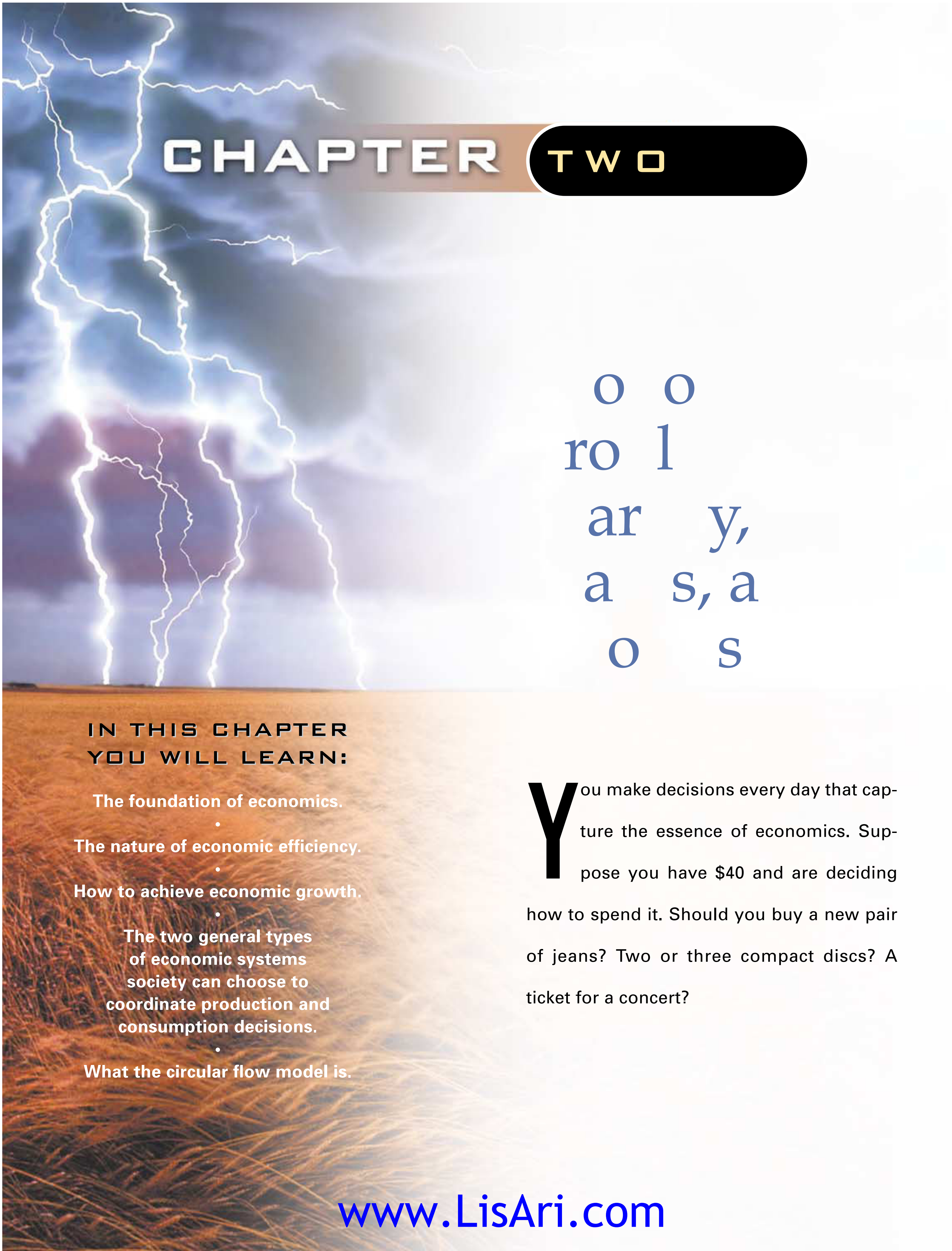
5. Suppose that when the interest rate on loans is 16 percent, businesses find it unprofitable to invest in machinery and equipment. However, when the interest rate is 14 percent, $5 billion worth of investment is profitable. At 12 percent interest, a total of $10 billion of investment is profitable. Similarly, total investment increases by $5 billion for each successive 2-percentage-point decline in the interest rate. Describe the relevant relationship between the interest rate and investment in words, in a table, graphically, and as an equation. Put the interest rate on the vertical axis and investment on the horizontal axis. In your equation use the form $i = a + bI$, where i is the interest rate, a is the vertical intercept, b is the slope of the line (which is negative), and I is the level of investment. Comment on the advantages and disadvantages of the verbal, tabular, graphical, and equation forms of description.

6. **KEY APPENDIX QUESTION** The accompanying graph shows curve XX' and tangents at points A, B, and C. Calculate the slope of the curve at these three points.



7. In the accompanying graph, is the slope of curve AA' positive or negative? Does the slope increase or decrease as we move along the curve from A to A'? Answer the same two questions for curve BB'.





CHAPTER TWO

o o
ro l
ar y,
a s, a
o s

IN THIS CHAPTER YOU WILL LEARN:

- The foundation of economics.
- The nature of economic efficiency.
- How to achieve economic growth.
- The two general types of economic systems society can choose to coordinate production and consumption decisions.
- What the circular flow model is.

You make decisions every day that capture the essence of economics. Suppose you have $40 and are deciding how to spend it. Should you buy a new pair of jeans? Two or three compact discs? A ticket for a concert?

o l yo or o or l yo ar a oll or rs y a o - ra sol ly o yo r o rs or a ra s s a a o o or yo , r s- os o os -s o ary a o yo o or , s o l ll- or ar - o l yo or o a s a lo r ay or o a s a r ay a ar l a o s o yo r loy or yo r o rs ra s o y a ar o s ar , a a s o s o o s ar y al ays a s r ar os s. yo oos a s, os s or o s or o r . yo or ll- , os r a r s r ss, oor r r or a yo r lass s, or a ra y ar or o s ool.

s a r a s a als o o o s s ar y, o , a os s. rs a *economic oblem,* o s los ly o *an* a *e o ce* . , lo o o o o ls (1) a *od c ion o ibili ie model* a or ora s a ll s ra ss ral y as, a (2) a s l *ci c la o model* a s a or ro s o s o a rs a a or ar s o o y.

THE FOUNDATION OF ECONOMICS

ECONOMIC PROBLEM Choices are necessary because society's material wants for goods and services are unlimited but the resources available to satisfy these wants are limited (scarce).

o a al a s o r o s **economic problem** a ro a o a o or o o s

- o y's a s ar r ally l a sa a l .
- r so r s or ro oo s a s r s o sa s y so y's a s ar l or s ar .

ll a ollo s s r ly o s o a s.

Unlimited Wants

UTILITY The satisfaction or pleasure a consumer obtains from the consumption of a good or a service.

a o a y a s a , rs , s r s o o s rs o o a a s ar o s oo s a s r s a ro **utility** a s, l as r or sa s- a o . s a s o r a ra o ro s, ro *nece i ie* (oo , s l r, a lo) o *l ie* (r s, ya s, ra ars). o a s as oo , lo , a s l r a olo al roo s. r a s or a l , s s o oo , lo , a s l r s ar roo o o s a s o s o so y.

r , a s a a o l ly, ll y ro s. o lo a o, o a rso al o rs, r s r , al r or rs, la s, or a rs a s y s ly o s . lso, sa s a o o r a a s s o r ro rs a s o o a s or or as o o a or a ors or a r s.

r s, as ll as ro s, sa s y o r a s. ar r a r or , r o al o a a a , l al a a o a , a a r s all sa s y a a s. ally, y a y oo s, s as a o o l s a as a s, or s r s y r r. r s oo s a s r s ar o s all r a y a ar o .

s ss s a s o o r also s r o sa s y o o oals. s- ss s a a or s, a ry, r s, ar o s s, a o sys s o l o a r ro o oals. Go r , r oll a s o s s or oals o s o , s s ays, s ools, a l ary .

ll s a s ar *in a iable,* or *nlimi ed,* a a o r s r s or oo s a s r s a o o l ly sa s . r s r s or a *a ic la* oo or s r

a sa s o ras or ro o a s r ly o oo as or as a. o a o y s l y.
oo s *in gene al* ar a o r s ory. o o , a r s a ly a o , o . os all rs o so y r as o l s oo s a s r s y o l y y a l o . a l s o l ro a ly r . s or , als a s o s a ra l ll a s. *The objec- i e of all economic ac i i i o f l ll an* .

Scarce Resources

ECONOMIC RESOURCES The land, labour, and entrepreneurial ability that are used in the production of goods and services.

LAND Natural resources (“free gifts of nature”) used to produce goods and services.

s o a al a s a *e o ce a e limi ed o ca ce.* y **economic resources** a all a ral, a , a a a r r so r s a o o ro o o oo s a s r s. a l s all a ory a ar l s a all , ools, a a ry s o ro a a r oo s a a r l ral ro s all ra s or a o a o a o a l s all y s o la o r a la a ral r so r s. o o s s lass y all s r so r s as r *o e* r so r s la a ra a r als a a al or *h man* r so r s la o r a r r r al a l y.

RESOURCE CATEGORIES

’s loo a o r s a or s o r so r s.

CAPITAL Human-made resources (buildings, machinery, and equipment) used to produce goods and services.

Land **Land** a s or o o o s a o s o os o l . o o o s la l s all a ral r so r s all s o a r a ar s ro o ro ss, s as ara l la , or s s, ral a o l os s, a a r r so r s.

INVESTMENT Spending for the production and accumulation of capital and additions to inventories.

Capital **Capital** (or *ca i al good* or *in e men good*) l s all a a r a s s ro o s r oo s a s r s a s, all ools, a ry, a , a a ory, s ora , ra s or a o , a s r o a l s. ro ss o ro a r as a al oo s s o as **investment**. *Ca i al good* r ro *con me good* a o s r oo s sa s y a s r ly, l a al oo s o so r ly y a ro o o o s r oo s. o a r a al as s y o o s s o s *no* r r o o y, o *eal ca i al* ools, a ry, a o r ro . o y ro- s o s *no* a o o r so r . o- all o y a al or a - al a al s s ly a a s or r as r al a al.

LABOUR The physical and mental talents and efforts of people that are used to produce goods and services.

Labour **Labour** s a roa r or all ys al a al al s o - als a a la l a sa l ro oo s a s r s. s r s o a lo r, r a l l r , a s, a r, ro ss o al oo all lay r, a l ar ys s all all r ral a la o r.

ENTREPRENEURIAL ABILITY The human resources that combine the other resources to produce a product, make non-routine decisions, innovate, and bear risks.

Entrepreneurial Ability ally, r s s al a r so r , s ro la o r, a la l **entrepreneurial ability**. r r r r or s s ral o s

- r r r *ake he ini ia i e* o r so r s o la , a - al, a la o r o ro a oo or a s r . r r r s r or ro o a a o o s o r r so r s a s o ll a s ss l s ss r .
- r r r *make ba ic b ine - olic deci ion* os o -ro - s o s a s o rs o a s ss r r s .

- r r r s a *inno a o* o o o r al s ro s, ro o s, or or s o s ss or a a o .
- r r r s a *i k bea e* . r r r a ar sys as o ara o ro . r ar or r r r's , or s, a a l- s ay ro s o loss s. r r r r s s o o ly s or r s s os o asso a s a s o ol rs as ll.

a s s o r r so r s la , la o r, a al, a r r r al a l y ar o o *od ce* oo s a s r s, y ar all **factors of production.**

FACTORS OF PRODUCTION Economic resources: land, capital, labour, and entrepreneurial ability.

RESOURCE PAYMENTS

o r ro s ly ra a r als a a al (ro r y r so r s) s all *en al income* a *in e e income,* r s ly. o a r o os o s ly la o r s all *age* , l s salar s a all a a salary s l s s as o s s, o ss o s, a royal s. r r r al o s all *o* , ay a a s, loss s.

RELATIVE SCARCITY

o r y s o r so r s, or a ors o ro o , or *in* , a o s a ara r s o o *The a e ca ce o limi ed in l .* r la o a s o ly , a r or l , a o s o ara l la , ral os s, a al , a la o r. r s ar y o s ra s ro a y a o . a a a, o o os a a o s, o r rso as l o ro ly $,000 2000. oor s a o s, a al o r rso ay as lo as $ 00 or $ 00.

ECONOMICS: GETTING THE MOST FROM AVAILABLE RESOURCES

o o ro l s a ar o o o o o s s a a- r 1 *Economic i he ocial cience conce ned i h he oblem of ing ca ce e o ce o a ain he ma im m f l llmen of ocie ' nlimi ed an .* o o s s o r o s a a .

o o s s s so al s a a s y s s o s ar r so r s. o y a s o s s l r so r s ly s r s o ro as a y oo s a s r s as oss l ro s a a la l r so r s, r y a o al sa s a o .

Full Employment: Using Available Resources

o r al s s o s ar r so r s, a so y s a o ll loy- a ll ro o . y **full employment** a s o all a a la l r so r s. o or rs s o l o o or y ar ll a a l o or . ors s o l a al or ara l la s l . o a say all *a ail- able* r so r s s o l loy . a so y as r a s o s a ra s a r a r so r s ar a a la l or loy a a r so r s ar o . or a l , os o r s l sla o a s o ro a l r a ry a s o l o loy . larly, o a a ro y, ar - la s o l allo o l allo r o ally. s o l o s r so r so r s s s o s a or s , or s a or s y r ra o s.

FULL EMPLOYMENT Use of all available resources to produce want-satisfying goods and services.

Full Production: Using Resources Efficiently

FULL PRODUCTION
Employment of available resources so that the maximum amount of goods and services is produced.

PRODUCTIVE EFFICIENCY
The production of a good in the least costly way.

ALLOCATIVE EFFICIENCY
The apportionment of resources among firms and industries to obtain the production of the products most wanted by society (consumers).

loy o all a a la l r so r s s o o o a y, o - r. ll ro o s also r al . y **full production** a a all loy r so r ss o l s so a y ro a oss l sa - s a o o o r a r al a s. a l or al ll ro o , o r r so r s ar *nde em lo ed.*

ll ro o l s o s o y ro a allo a - y. **Productive efficiency** s ro o o *an a ic la mi of good and e - ice in he lea co l a .* ro , say, o a s s a lo s a a l os , ar s all s a o o r so r s o ro s a ar r or a a a la l lar s a o o r so r s o ro o r s r ro s. os so y as o ly $100 or o r so r s a a la l . a ro a or o ly $ o os r so r s, $ ll a a la l o ro o r oo s. s s l arly r a ro or $10 a a - o ly $ 0 o r so r s a a la l or al r a s s.

o ras , **allocative efficiency** s ro o o *ha a ic la mi of good and e ice mo an ed b ocie* . or a l , so y a s r so r s allo a o o a s s a ass s, o o r r or s. a rso al o rs (s), o a al y r rs. r r or , o o a o o *all* o r r so r s o ro s a s a o ass so o o ro a o o l s a o l s. llo a y r r s a a o o y ro r o oo s a s r s, a ro a lo s oss l os . a s a or o l r so r s a o r s a s r s s a ay a so y o a s o a o o oo s a s r s a s os . (*Key Question 5*)

QUICK REVIEW

- People’s wants are virtually unlimited.
- Resources—land, capital, labour, and entrepreneurial ability needed to produce the goods and services to satisfy people’s wants—are scarce.
- Economics is concerned with the efficient allocation of scarce resources to achieve the maximum fulfillment of society’s wants.
- Economic efficiency requires full employment and full production.
- Full production requires both productive and allocative efficiency.

Production Possibilities Table

a s r so r s ar s ar , a ll- loy , ll- ro o o o y a o a a l o o oo s a s r s. o s ly, so y s oos oo s a s r s o ro a o or o. ss y a o s - s o os o s a s rs oo ro a *od c ion o ibili ie model.* a o l rs as a a l , as a ra .

ASSUMPTIONS

o r s ss o o ro o oss l s o l s l y ass o s

- *Full employment and productive efficiency* o o y s loy all s a a la l r so r s (ll loy) a s ro oo s a s r s a l as os (ro y).
- *Fixed resources* a a la l s l s o a ors o ro o ar o a y a al y. r l ss, y a r allo a , l s, a o r s s or a l , la a s r or a ory s s or or oo ro o .
- *Fixed technology* s a o olo y o s o a r o r a aly- s s. s ass o a r o s o ly a ar loo a a o o y a a r a o or o r a ry s or r o o .
- *Two goods* o o y s ro o ly o oo s as a s- r al ro o s. as sy ol **consumer goods**, ro s a sa s y o r a s *di ec l* s r al ro o s sy ol **capital goods**, ro s a sa s y o r a s *indi ec l* y a oss l or ro o o o - s r oo s.

CONSUMER GOODS Products and services that satisfy human wants directly.

CAPITAL GOODS Goods that do not directly satisfy human wants.

PRODUCTION POSSIBILITIES TABLE A table showing the different combinations of two products that can be produced with a specific set of resources in a full-employment, full-production economy.

THE NEED FOR CHOICE

G o r ass o s, s a so y s oos a o al r a s. r so r s a l o s o a a ro o s. s all a a la l r so r s ar lly loy , o r as ro o o ro o s s s r so r s a ay ro ro o o as. r rs s also r o r as ro o o as, s s r so r s a ay ro ro o o ro o s. r s o s as a r a. s, r all, s ss o o- o ro l .

production possibilities table l s s r o a o s o o ro s a a ro a s s o r so r s (a ll loy *and* ro y). a l 2-1 s s a a l or a a-ro o o o y a a ar , o o rs , y o al. al r a , s o o y o l o all s a a la l r so r s o ro o o ro o s (a al oo s) a al r a , all r so r s o l o o a ro o (o s r oo s). os al r a s ar r al s r s a o o y y ally ro s o a al oo s a o s r oo s, as , , a . s o ro al r a o , r as ro o o a a s o ro o ro o .

a s o s r oo s sa s y o r a s r ly, a y o o ar loo s - . ro or as, so y r as s rr sa s a o o s a s. r s a os or as a r ro o s. s s o r so r s o o s r oo s a s so y o r as s o o a - al oo s l s, r s l a so o al or r a r r ro o s los . y o o ar al r a , so y oos s or o a s o or la r.

y o o ar , so y oos s o or o rr o s o , r y r r so r s a a s o r as ro-

TABLE 2-1 PRODUCTION POSSIBILITIES OF PIZZAS AND ROBOTS WITH FULL EMPLOYMENT AND PRODUCTIVE EFFICIENCY

PRODUCTION ALTERNATIVES					
Type of product	**A**	**B**	**C**	**D**	**E**
Pizza (in hundred thousands)	0	1	2	3	4
Robots (in thousands)	10	9	7	4	0

o o a al oo s. y l s s o o a al, so y ll a r a r r ro o a , r or , r a r r o s o . y o o ar , so y s oos or la r a os o l ss o .

G ral a o *A an oin in ime, an econom achie ing f ll em lo men and o- d c i e ef cienc m ac i ce ome of one good o ob ain mo e of ano he good.*

Production Possibilities Curve

a a r s a ro o oss l s a l a also s o ra ally. s a s l o- s o al ra , ar rar ly r r s o o a - al oo s (r , ro o s) o r al a s a o o o s r oo s (r , as) o or o al a s, as s o **igure 2-1 (ey Graph)**. ollo ro r a o a r 1, a ra a **production possibilities curve**.

PRODUCTION POSSIBILITIES CURVE A curve showing the different combinations of goods and services that can be produced in a full-employment, full-production economy where the available supplies of resources and technology are fixed.

a o o ro o oss l s r r r s s so a o - o o ro s. r s a ro o *f on ie* a s s o s l o a a a l o s. oo a ar o s o a o so a a ro o s *on* ro o oss l s r , so y s a o ll loy a ro- y. o s ly *in ide* (o l o) r ar also a a a l , y ar a r or ar o as s ra l as o s o r . o s s r ly a o o y o l a or o o ro o s a as a ll loy a ro y. o s ly *o ide* (o r o) ro o oss l s r , l o *W*, o l r r s a r a r o a o a a y o o r . o s, o r, ar a - a a l rr s l s o r so r s a olo y.

Law of Increasing Opportunity Cost

a s r so r s ar s ar r la o r ally l a s y a s o sa s y, o l s oos a o al r a s. or as a r ro o s. a o o o r ro s a s sa r oo a o o a s oo s all **opportunity cost** o a oo . o r as , r o ro o s a s o a o r o a s *o o ni co* , or s ly *co* , o a o a.

OPPORTUNITY COST The amount of other products that must be forgone or sacrificed to produce a unit of a product.

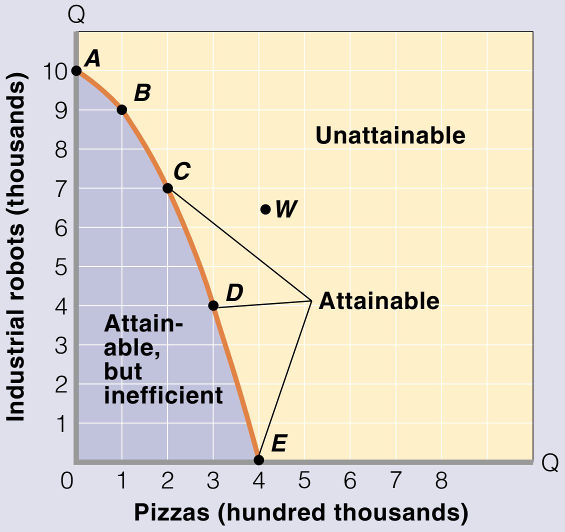
KEY CONCEPTS Opportunity Costs

o ro al r a o al r a a l 2-1, os o 1 a o al o as s 1 l ss o ro o s. as rs o o os ro a o al ro o oss l s o , o , a o a or a o o r l s r al o or y os o a a o al o a s r a r a o or y os o r o . o ro o , s 1 o ro o s s sa r or 1 or o a o ro o sa r 2 a o al s o ro o s or 1 or o a or o ro o s or 1 or o a a ally or 1. o rs ly, o r a as o ro o , os o a a o al ro o s ^{1}, ^{1}, ^{1}2, a 1 o a, r s - ly, or o r s ss o s. o o o s a o s o or y os s

- r o or y os s ar as r *eal* r s, a s, a al oo s ra r a o y r s.
- ar s ss *ma ginal* (a ra) o or y os s, ra r a la or o al o or y os s. or a l , ar al o or y os o r o a a l 2-1 s s o ro o s ( ). *o al* o or y os o s o a s s o ro o s (1 o ro o s

Key Graph FIGURE 2-1 THE PRODUCTION POSSIBILITIES CURVE

Each point *on* the production possibilities curve represents some maximum combination of two products that can be produced if full employment and full production are achieved. When operating on the curve, more robots means fewer pizzas, and vice versa. Limited resources and a fixed technology make any combination of robots and pizzas lying outside the curve (such as at *W*) unattainable. Points inside the curve are attainable, but they indicate that full employment and productive efficiency are not being realized.



QUICK QUIZ

1. **Production possibilities curve *ABCDE* is bowed out from the origin (concave to the origin) because:**
   a. the marginal benefit of pizzas declines as more pizzas are consumed.
   b. the curve gets steeper as we move from *E* to *A*.
   c. it reflects the law of increasing opportunity costs.
   d. resources are scarce.

2. **The marginal opportunity cost of the second unit of pizzas is:**
   a. 2 units of robots.
   b. 3 units of robots.
   c. 7 units of robots.
   d. 9 units of robots.

3. **The total opportunity cost of 7 units of robots is:**
   a. 1 unit of pizza.
   b. 2 units of pizza.
   c. 3 units of pizza.
   d. 4 units of pizza.

4. **All points on this production possibilities curve necessarily represent:**
   a. allocative efficiency.
   b. less than full use of resources.
   c. unattainable levels of output.
   d. productive efficiency.

Answers:

1. c; 2. a; 3. b; 4. d

or rs o a *l* 2 so ro o s or s o o a *l* so ro o s or r o a).

LAW OF INCREASING OPPORTUNITY COSTS As the production of a good increases, the opportunity cost of producing an additional unit rises.

r a l ll s ra s **law of increasing opportunity costs:** or o a ro a s ro , r a r s s o or y os (ar al l).

SHAPE OF THE CURVE

la o r as o or y os s s r s a o ro o oss l s r r s o o ro or o ra . r 2-1 s o s a o o y o s ro *A* o *E*, s ss ly lar r a o s o ro o s (1, 2, , a) ar o a r al r s o a (1, 1, 1, a 1). s s s o slo o ro o oss l s r , o s s r as o ro *A* o *E*. r a s s r as o o s o a o or .

ECONOMIC RATIONALE

a s o o ra o al or la o r as o or y os s y o s sa r o ro o s r as as ro or as a s r s a *e o ce a e no com le el ada able o al e na i e e* . a y r so r s ar r a ro o oo a a ro o rs. r l ar la s ly s o ro r s o a as, l la r ral os s s ly s o ro a r als o a ro o s. s s a ro o , r so r s a ar l ss a l ss a a a l o a - as s s o a ro o . s ar a *A* a o o *B*, a s r so r s os ro y o as s r a s r la o o r ro- y o ro o s. as o ro *B* o *C*, *C* o *D*, a so o , r so r s ly ro o as o r as ly s ar . o or as, r so r s os ro y o ro o s s r a r la o o r ro y o as ll . ll a or a or o s r so r s, a r a r sa r s o ro o s, o a a r as o 1 ro o o as. s la o r l y, or r a a l l y, o ar o r so r s s a s o r as o or y os s. (*Key Question 6*)

Allocative Efficiency Revisited

o ar, a ass ll loy a ro y, o o ar ssary o r al *an oin* o a o o y's ro o oss l s r . o r o allo a y, r r s a o o y ro a os al , or *o imal,* o o ro o oss l s r . all a a a l o a o s o as a ro o s o r r 2-1, s s a s, a s a s o r so r ss o l allo a o as a a s a s o ro o s or r o a sa s a o r s ss o o *economic e ec i e* a r 1 s s o r ra . all a o o s o s r o o ar so s o ar al s a ar- al os s. y o o a y or a l , ro o or o s o s o l a as lo as ar al s ar al os a s o l r ar al os s ar al . o al a o o a y o rs r .

o s r as. alr a y o ro la o r as o or y os s a ar al os ( ) o a o al s o as ll r s as or s ar ro . s a s o y a slo r , as r 2-2. also o a o a ra or ar al s ( ) ro a o al s o as. o r, al o a r al a s a r a ar sa a l , s s r al a s o o a ar lar ro y l s l ss a o al o a rso a rs . a r ro s l ss a s o . o s or so y as a ol . r or a or ray ar al s ro as a o slo r , as r 2-2. l o o al s r s so y o s s or as, ar al s l .

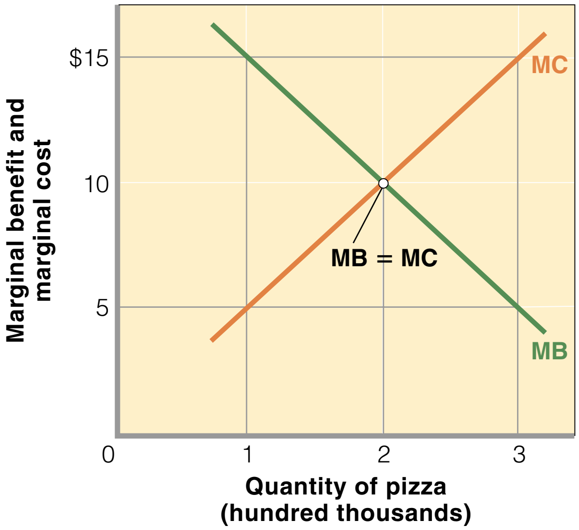
o al a y o a ro o s a y rs o o a r s 200,000 s r 2-2. y s s o al a y o ly 100,000 as r ro , ar al o as o l s ar al os . o y r s, $1 , l s o ly $. s s s s a so y o l *nde alloca ing* r so r s o a ro o a a or o s o l ro .

o o o a s so y al s a a o al a as or $1 , l al r a ro s a os r so r s o l ro ar or o ly $. o y s r a a so al $1 y or o so al o ly $. o y o l s s r so r s or ly y allo a or r so r s o a. a a o al a o 200,000 o l ro s a a , a a allo a y o l ro y a ro o .

, s o ro as or al r a ro s a a la l r so r s ar al. llo a y s a r .

ro o o 00,000 as o l r r s a *o e alloca ion* o r so r s o a ro o . r o as s $1 a s s o ly $. s a s a 1 o a s or o ly $ o so y, l al r a ro s a os r so r s o l o r s ro ar al a $1 . y ro 1 1 ss , so y los s a a or $. y r allo a r r so r s, a so r ro s or $1 . so y a s so or $1 y or o so -

FIGURE 2-2



Allocative efficiency requires the expansion of a good's output until its marginal benefit (MB) and marginal cost (MC) are equal. No resources beyond that point should get allocated to the product. Here, allocative efficiency occurs when 200,000 pizzas are produced.

or o ly $, s ro . r 2-2, s a s a r al l a ro o as r o 200,000.

G ral a o *Re o ce a e being ef cien l alloca ed o an od c hen he ma ginal bene and ma ginal co of i o a e e al (MB = MC).* os a y a ly- a o a alys s o ro o s, r o al ( ) o s 000. s o l a a al r a o o r ro o oss l s r 200,000 as a 000 ro o s o l r s l allo a y or o r y o al o o y. (***Key Question 9***)

QUICK REVIEW

- The production possibilities curve illustrates four concepts: (a) *scarcity* of resources is implied by the area of unattainable combinations of output lying outside the production possibilities curve; (b) *choice* among outputs is reflected in the variety of attainable combinations of goods lying along the curve; (c) *opportunity cost* is illustrated by the downward slope of the curve; (d) the law of *increasing opportunity costs* is implied by the concavity of the curve.
- Full employment and productive efficiency must be realized in order for the economy to operate on its production possibilities curve.
- A comparison of marginal benefits and marginal costs is needed to determine allocative efficiency—the best or optimal output mix on the curve.

UNEMPLOYMENT, GROWTH, AND THE FUTURE

’s o s ar rs r ass o s rly ro o oss l- s r a s a a s.

Unemployment and Productive Inefficiency

rs ass o as a o r o o y as a ll loy a ro- y. r a alys s a o l s o s a so r so r s ar l (loy) or l as - os ro o s o r al . al r a s a l 2-1 r r s a o s y ll s ra o a o so ro o s a as a a ro o o y s o ra a ll a a y ll loy a ro y. loy or ro- o , o o y o l ro l ss a a al r a s o a l . Gra ally, r r s s a o s o loy or ro y y o s *in ide* or al ro o oss l s r (r ro r 2-). o *U* s o s o . r o o y s all s or o ar o s a - o a o s o as a ro o s r r s y o s *on* ro o oss l s r . arro s r 2- a r oss l a s a o ll- loy a l as - os ro o . o o ar ll loy a ro- y o l y l a r a ro o o or o ro s.

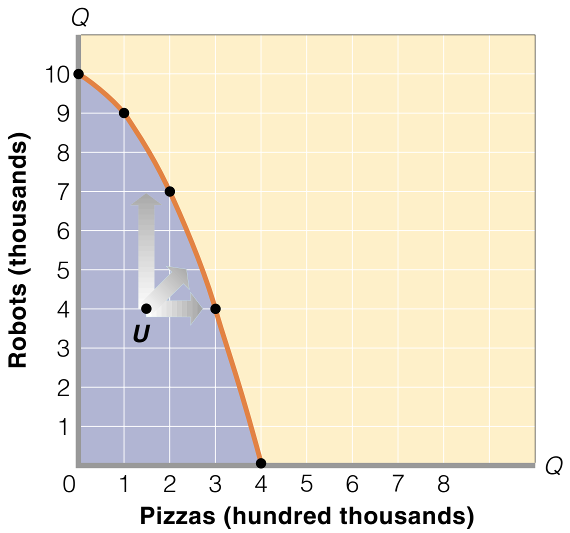
A Growing Economy

Production and the Standard of Living

ro ass o s a a y a al y o r so r s a - olo y ar , ro o oss l s r s s os o s a s, o al a o o o o y a s.

FIGURE 2-3 UNEMPLOYMENT, PRODUCTIVE INEFFICIENCY, AND THE PRODUCTION POSSIBILITIES CURVE

Any point inside the production possibilities curve, such as *U*, represents unemployment or a failure to achieve productive efficiency. The arrows indicate that, by realizing full employment and productive efficiency, the economy could operate on the curve. This means it could produce more of one or both products than it is producing at point *U*.



INCREASES IN RESOURCE SUPPLIES

l o r so r s l s ar a a y s o , y a a o a o r . or a l , a a o 's ro o la o ll r a o r as s s l so la o r a r r r al a l y. lso, la o r al y s ally ro s o r . s or ally, o o y's s o o a al as r as a a s a , o s a y, ra . al o ar l so o o r r y a ral r so r s, so r s ar s o r .

lo o rr a o ro ra s, or a l , a s o s ly o ara l la . r s l o s r as s l s o a ors o ro o s a l y o ro or o o as a ro o s. s, 20 y ars ro o , ro o oss l s a l 2-2 ay s rs os s o a l 2-1. r a r a a o r so r s ll r s l a r a r o al o o o or o ro s a a al r a . o - y ll a a o o ro or o a a o al o .

s a a o ra l a ro - o oss l s a a o s o *g a an ee* a o o y ll a ally o ra a a o o s ro o oss l s r . o 1 ll o o s ll a a a ll loy o , 10 or 20 y ars ro o s la o r or ll lar r, a 1 ll o o s ll o s or ll loy . ro - o oss l s r ay s , a r a o o y ay a l o ro a a o o a r .

TABLE 2-2 PRODUCTION POSSIBILITIES OF PIZZA AND ROBOTS WITH FULL EMPLOYMENT AND PRODUCTIVE EFFICIENCY

	PRODUCTION ALTERNATIVES				
Type of product	A′	B′	C′	D′	E′
Pizzas (in hundred thousands)	0	2	4	6	8
Robots (in thousands)	14	12	9	5	0

ADVANCES IN TECHNOLOGY

rs o ass o s a a o s a , a olo y. r al y, olo y as ro r ss ra a ally o r . a a olo y r s o a r oo s *and* ro ays o ro . or o , l ’s o olo al a a s as o ly ro s a al a l s or a ry a . s a a s al r o r r o s s-ss o o o o ro l y ro ro y, r y allo so y o ro or oo s r so r s. s r as s r so r s l s, olo al a a s a oss l ro o o or ro o s *and* or as.

s, r s l s o r so r s r as or a ro ol-o y o rs, ro o oss l s r r 2- s s o ar a o r , as ll s ra y r *A′, B′, C′, D′, E′* r 2- . a o ar s o ro o oss l s r r r s s ro o o o a a y or, s -ly, **economic growth:** *he abili o od ce a la ge o al o* . s ro s r s l o (1) r as s s l s o r so r s, (2) ro s r so r al-y, a ( ) olo al a a s.

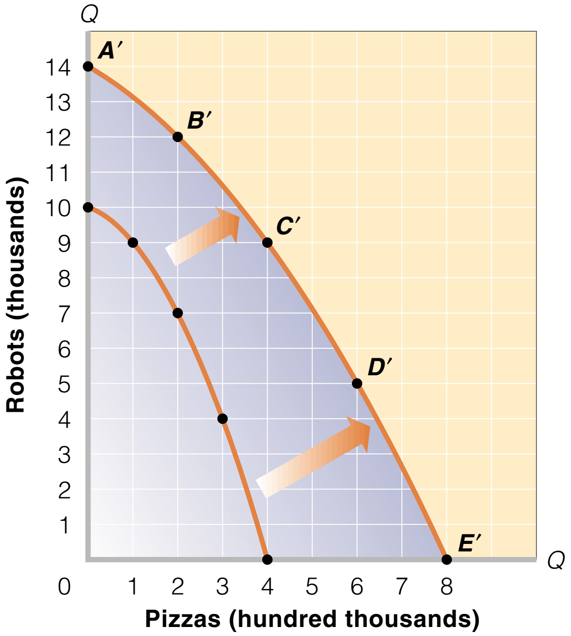
ECONOMIC GROWTH An outward shift in the production possibilities curve that results from an increase in resource supplies or quality or an improvement in technology.

o s o ro s a o r ll- loy o o y a oy a r a r o o o ro o s a as. *While a a ic, no-g o h econom m ac-i ce ome of one od c in o de o ge mo e of ano he , a d namic, g o ing econom can ha e la ge an i ie of bo h od c .*

o o ro o s o or ar ly a ro or o a r as s a a o ’s a a y o ro all s ro s. o r 2- a , a a s, o o y a ro as a y as as or o ly 0 r or ro o s. o r or yo r rs a o s o , s o ro -

FIGURE 2-4

The increase in supplies of resources, the improvements in resource quality, and the technological advances that occur in a dynamic economy move the production possibilities curve outward and to the right, allowing the economy to have larger quantities of both types of goods.



o oss l s r so s o s a o r a r or roro o s as lo l olo y or ro as s a , a o r ll s ra a ro olo y or as l olo y or ro ro o s r a s o s a .

PRESENT CHOICES AND FUTURE POSSIBILITIES

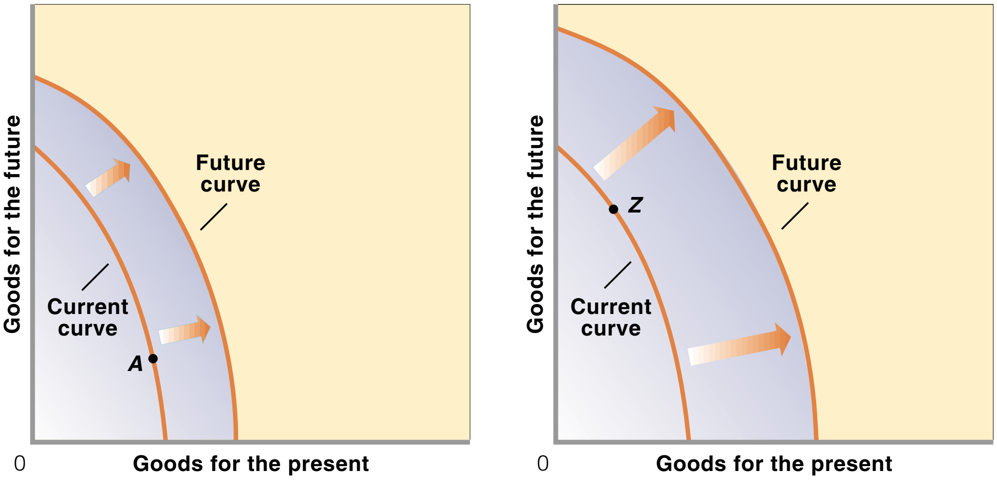
o o y's rr os o o s ro o oss l s r s a as r a o r lo a o o a r . 's s a o a s o ro o oss l s r as *good fo he f e a good fo he e en* , as r 2- . Goo s or r ar s s as a al oo s, r s ar a a o , a r . y r as a y a al y o ro r y r so r s, lar s o o olo al or a o , a ro al y o a r so r s. s a alr a y s , oo s or r , l s r al ro o s, ar r s o o o ro . Goo s or r s ar r os r oo s, s as a, lo , a so r s.

o s os r ar o o o s, l a a or , ar ally al ry r s o l a's rr o o os o s o s ro o oss l s r s ro ly a o rs r s oo s o r r oo s. o *A* r 2- (a) a s a o . s lo a ar o r o r , a a r or y or oo s or r s , a s o r oo s or r . or , o ras , a s a rr o a s r ss s lar r a o s o r oo s a s all r a o s o r s oo s, as s o y o *Z* r 2- ( ).

r s al, a r ro o oss l s r o or o ar r o r a l a's r . y rr ly oos a o or a o ra l o olo al a a s a o r as s a y a al y o r so r s, or ll a r a r o o ro a l a. r s

FIGURE 2-5 AN ECONOMY'S PRESENT POSITION ON ITS PRODUCTION POSSIBILITIES CURVE DETERMINES THE CURVE'S FUTURE LOCATION

A nation's current choice favouring "present goods," as made by Alta in (a), will cause a modest outward shift of the curve in the future. A nation's current choice favouring "future goods," as made by Zorn in (b), will result in a greater outward shift of the curve in the future.



(a) Alta

(b) Zorn

o a al oo s, or s oos o a lar r rr a o s o s a o al a ory o s or o s rr o a l a. ayo ro s o or or s or ra ro r a r r ro o a a y. o or y os s r o s r oo s r s or or o oy. (Glo al rs 2.1.)

s or 's o s r a l a's a , a o say. r o - o s s ly r r r r s a r or s o o r s. (*Key Question 10 and 11*)

A Qualification: International Trade

ro o oss l sa alys s l s a a a o sl o o a o s o o a y s ro o oss l s r . B *e m modif hi in- ci le hen in e na ional eciali a ion and ade e i* .

o ll s la r a rs a a o o y a a o , ro r a o al s al a o a ra , o l s os y s o s ro o os- s l s r . *In e na ional eciali a ion* a s r o s r so r s oo - a a a o s ly a ro . *In e na ional ade* ol s a o s oo s or oo s ro a roa . al a o a ra a l a a o o or o a s r oo a l ss sa r o so o r oo . a r a sa r r ro o s o a r o a, as a l 2-1, a a o a l oo a r o a y ra o ly o s o ro o s or . al a o a ra a sa as a or a r r so r s or s o r ro ro o s o r as a - s o a al a o s r oo s a a la l o so y.

QUICK REVIEW

- Unemployment and the failure to achieve productive efficiency cause an economy to operate at a point inside its production possibilities curve.
- Increases in resource supplies, improvements in resources quality, and technological advance cause economic growth, which is depicted as an outward shift of the production possibilities curve.
- Society's present choice of capital and consumer goods helps determine the future location of its production possibilities curve.
- International specialization and trade enable a nation to obtain more goods than its production possibilities curve indicates.

Examples and Applications

r ar a y oss l a l a o s a a l s r la o ro o os- s l s o l. ll s ss s a o .

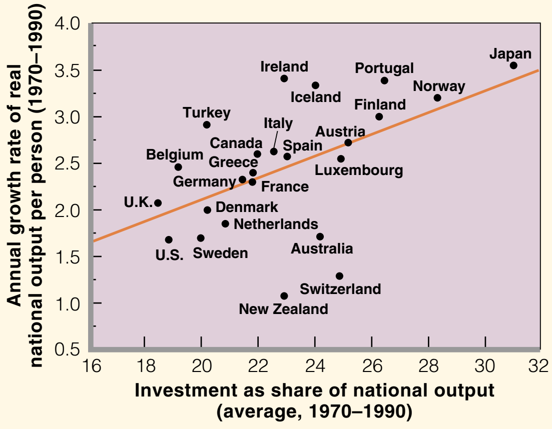
UNEMPLOYMENT AND PRODUCTIVE INEFFICIENCY

l os all a o s a a o o or a o r r s r a - loy o r so r s. a s, y a o ra s o r ro o os- s l s r s. s o Gr a r ss o o 1 0s, 20 r o a a a's or rs r loy a o - r o a a a ro o a a - y as l . las al o 1 0s, s ral o r s (or a l , r a, a a , o, a o or a) o ra s r ro o oss l s r s, a l as orar ly, a s o s s a al l s o o a y.

GLOBAL PERSPECTIVE 2.1

Investment and economic growth, selected countries

Nations that invest large portions of their national output tend to achieve high growth rates, measured here by output per person. Additional capital goods make workers more productive, which means greater output per person.



Source: International Monetary Fund

o o s a r s s a al s r a o as o ra , y, a r o o a ro y a s o ra s r ro- o oss l s r s. a s s r a o r s os s r a a a s ro o a o s a s s r s lls, so y as l ss o a o r s . l a s r a o o l o s a o o y ro a o s o s ro o oss l s r o ar a o o s r . larly, o o s la o r sa a ro o o s ar as o s o , r y, a as , ra r a o y, o ra ll s r ro o oss l s r s.

TRADEOFFS AND OPPORTUNITY COSTS

KEY CONCEPTS **Facing Tradeoffs**

a y rr o ro rs s ll s ra ra o s a o or y os s a o s alo a ar lar ro o oss l s r . (y o a or s o o a la o a s o ro o oss l s r s.) o l s la s or lo a or r s r as l r ss la s s or lo a , o or y os s or o s o l r ss. la s s or l r ss, o or y os s los al o oo a rals a so y or o s.

o l so y o or r so r s o r al s sys (ol , o r s, a r so s) or o a o (a rs, oo s, a s ools) so y o s or r so r s o r al s sys , o r s al, o or- y os s or o ro s a o . or r so r s ar allo a o a o , o or y os s or o s ro a ro r al s sys .

SHIFTS IN PRODUCTION POSSIBILITIES CURVES

a a a as r ly r as r o olo s r la o o rs, o a o s, a o olo y. olo al a a s a ro r s o o rs a r a ly a r s . ll lar o s a r a r as o a o s a a y, a ro o a ro y o ar s. a s o olo y, s ally r , a r s l or a a r l ral a al s o r s. a y o o ss l a s olo s ar so s a a y ar o- r o as r- a - or al o o ro (as r r ar s s o ro- o oss l s r).

so r s a s a a o 's ro o oss l s r a olla s ar . or a l , la 1 0s osla a or s a o ally l a s oso o y r o s sl r s s. s l ary r s o s y a a a a s all s ally s osla a o o oso o. l ary a o also as a osla a's o o y. ll o r a ys al a a o osla a's ro o a l s a s sys o roa s, r s, a o a- o . o s ly, osla a's ro o oss l s r s ar .

ECONOMIC SYSTEMS

ECONOMIC SYSTEM A particular set of institutional arrangements and a coordinating mechanism for solving the economizing problem.

ry so y s o lo a **economic system** *a a ic la e of in i ional a angemen and a coo dina ing mechani m* o r s o o o o ro l . o o sys s r as o (1) o o s a ors o ro o a (2) o s o oor a a r o o a y. r ar o ral y s o o o sys s ar sys a o a sys .

The Market System

MARKET SYSTEM An economic system in which property resources are privately owned and markets and prices are used to direct and coordinate economic activities.

r a o rs o r so r s a s o ar s a r s o oor a a r o o a y ara r **market system**, or *ca i ali m*. a sys a ar a a s s or r o s l - r s a al or s - ss s s o a s sa s a o or ro ro s o s o s r ar o s o or ro o . sys allo s or r a o rs o a - al, o a s ro r s, a oor a s o o a y ro *ma - ke* la s r y rs a s ll rs o o r. Goo s a s r s ar ro a r so r s ar s l y o r s ll a a l o o so. r s l s o o a o ly a y rs a s ll rs o a ro - a r so r . s, o o s o a s ly s rs .

e a al s or *lai e -fai e* a al s o r 's rol s l o ro o r a ro r y a s a l s a ro a ro r a o o ra o o ar sys . r *lai e -fai e* a s l , a s, o r ro r r o o y. a s a s r r ll s r or o ar sys .

a al s ra s a a a a os o r o r s, o r lays a s s a al rol o o y. o o ly ro s r l s or o o a y also ro o s o o s a l y a ro , ro s r a oo s a s r s a o l o r s r ro or o ro a all, a o s s r o o o . o r , o r, s o o a lay r a o ro , o o ro , a o ll . s s o s ar r y ar or s.

COMMAND SYSTEM An economic system in which most property resources are owned by the government and economic decisions are made by a central government body.

The Command System

al r a o ar sys s **command system**, also o as *ocial- i m* or *comm ni m*. a sys , o r o s os ro r y r so r s a o o s o a o rs ro a ral o o la . o r ral la oar r s arly all a or s o s o r s o r so r s, o os o a s r o o o , a or a a o o ro o . o r o s os o s ss r s, ro a or o o r r s. ral la oar r s ro - o oals or a r rs a s s a o o r so r s o allo a o a r rs so a a r a s ro o oals. s o o o a o o la o s rally , a a al oo s ar allo a a o s r s o as s o ral la oar 's lo - r r or s.

e o a o o y o l r ly l s ly o a ral la o allo a o r -o ro r y r so r s. , r al y, r - o - a o o y o o ol ra so r a o rs a or- ora so ar s or s s 1 1. r or s ss a a os o as r ro a a o s a o o r or a o r ra s or r o a o o s o ar -or sys s. a's r or s a o o as ar, a r r l a o ral la . l o r s s ll - s o r o rs o r so r s a a al a, as r as ly r l o r ar s o or a a oor a s o o y. or or a a a ar las r a a l s o lar ly rally la o o s.

THE CIRCULAR FLOW MODEL

a s arly all o a or a o s o s ar sys , o a a oo rs a o o s sys o ra s. r oal r a ro s a r s o y ar o o y's s o a rs a a or ar s. a r ll la o r s ar s a l s al ar s. a r ll a l ara r s s o ar sys a la o a r ss s o o ro l . s s o **igure 2-6 (ey Graph)**, ar o o y as o ro s o s o a rs *ho ehold* a *b ine e .* also as o roa ar s *e o ce ma ke* a *od c ma ke*

r al o a ra r r s s **resource market:** *he lace he e e o ce o he e ice of e o ce lie a e bo gh and old.* so r s ar , o s ol ss ll r so r s a s ss s r as s . o s ol s(a s, o- l) o all r so r s r r ly as or rs or r r rs or r ly ro r o rs (ro s o s) o s ss or ora o s. y s ll r r so r s o s ss s, y a s y ar ssary or ro oo s a s r s. o y a s ss s ay or r so r s ar os s o s- ss s ar o s o a , r , r s , a ro o o o s ol s. so r s r or o ro o s ol s o s ss s, a o y o s ro s ss s o o s ol s.

o s r lo r ar o a ra a r r s s **product market:** *he lace he e good and e ice od ced b b ine e a e bo gh and old.* ro - ar , s ss s o r so r s y a o a o ro a s ll oo s a s r s. o s ol s s o y a r ro sal o r so r s o y oo s a s r s. o ary o o o s r s o oo s a s r s y l s sal s r s or s ss s.

circular flow model s o s rr la o s o a a o- o a y ol s ss s a o s ol s. s ss s a o s ol s ar o y rs a s ll rs. s ss s y r so r s a s ll ro s. o s ol s y ro s a s ll r so r s. ss o r 2- , r s a o r lo s *eal o* o r so r s a s oo s a s r s, a a lo s *mone o o* o a o s o r s. s o s ar s l a o s a r .

RESOURCE MARKET A market in which households sell and firms buy resources or the services of resources.

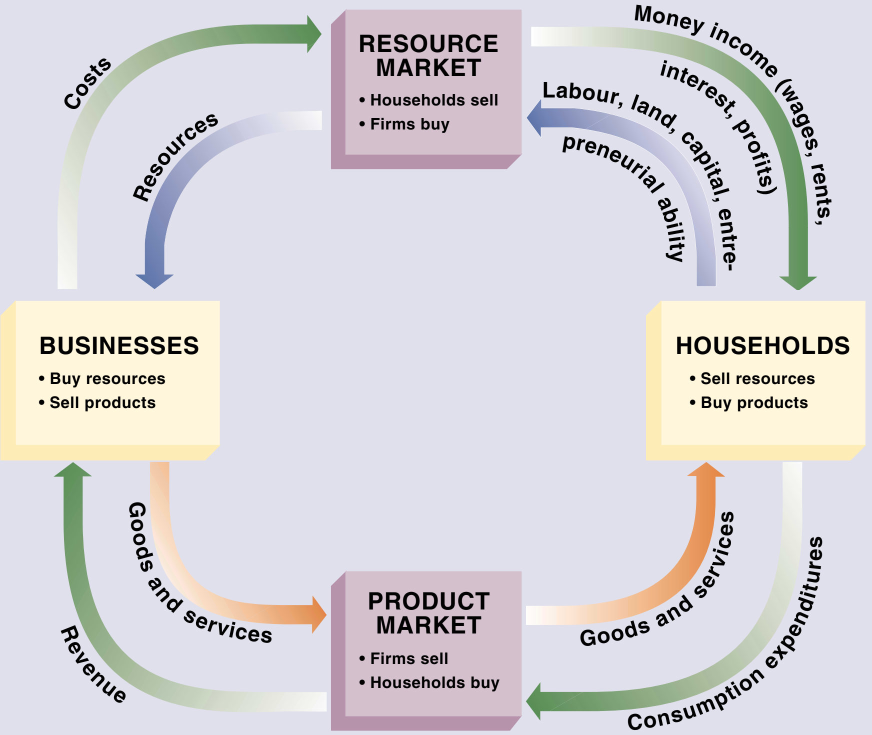
PRODUCT MARKET A market in which products are sold by firms and bought by households.

CIRCULAR FLOW MODEL The flow of resources from households to firms and of products from firms to households. These flows are accompanied by reverse flows of money from firms to households and from households to firms.

Key Graph

FIGURE 2-6 THE CIRCULAR FLOW DIAGRAM

Resources flow from households to businesses through the resource market and products flow from businesses to household through the product market. Opposite these real flows are monetary flows. Households receive income from businesses (their costs) through the resource market and businesses receive revenue from households (their expenditures) through the product market.



QUICK QUIZ

1. The resource market is where:
   a. households sell products and businesses buy products.
   b. businesses sell resources and households sell products.
   c. households sell resources and businesses buy resources (or the services of resources).
   d. businesses sell resources and households buy resources (or the services of resources).

2. Which of the following would be determined in the product market?
   a. a manager's salary
   b. the price of equipment used in a bottling plant
   c. the price of 80 hectares of farmland
   d. the price of a new pair of athletic shoes

3. In this circular flow diagram:
   a. money flows counterclockwise.
   b. resources flow counterclockwise.
   c. goods and services flow clockwise.
   d. households are on the selling side of the product market.

4. In this circular flow diagram:
   a. households spend income in the product market.
   b. firms sell resources to households.
   c. households receive income through the product market.
   d. households produce goods.

Answers:

1. c; 2. d; 3. b; 4. a

The LAST word

WOMEN AND EXPANDED PRODUCTION POSSIBILITIES

A large increase in the number of employed women has shifted the U.S. production possibilities curve outward.

One of the more remarkable trends of the past half-century in Canada has been the substantial rise in the number of women working in the paid workforce. Today, nearly 70 percent of women work full-time or part-time in paid jobs, compared to only 31 percent in 1965. There are many reasons for this increase.

Women's Rising Wage Rates Over recent years, women have greatly increased their productivity in the workplace, mostly by becoming better educated and professionally trained. As a result, they can earn higher wages. Because those higher wages have increased the opportunity costs—the forgone wage earnings—of staying at home, women have substituted employment in the labour market for more "expensive" traditional home activities. This substitution has been particularly pronounced among married women.

Women's higher wages and longer hours away from home have produced creative reallocations of time and purchasing patterns. Daycare services have partly replaced personal child care. Restaurants, take-home meals, and pizza delivery often substitute for traditional home cooking. Convenience stores and catalogue and Internet sales have proliferated, as have lawn-care and in-home cleaning services. Microwave ovens, dishwashers, automatic washers and dryers, and other household "capital goods" enhance domestic productivity.

Expanded Job Access Greater access to jobs is a second factor increasing the employment of women. Service industries—teaching, nursing, and clerical work, for instance—that traditionally have employed mainly women have expanded in the past several decades. Also, population in general has shifted from farms and rural regions to urban areas, where jobs for women are more abundant and more geographically accessible. The decline in the average length of the workweek and the increased availability of part-time jobs have also made it easier for women to combine labour market employment with child-rearing and household activities.

Changing Preferences and Attitudes Women collectively have changed their preferences from household activities to employment in the labour market. Many find personal fulfillment in jobs, careers, and earnings, as evidenced by the huge influx of women into law, medicine, business, and other professions.

More broadly, most industrial societies now widely accept and encourage labour force participation by women, including those with very young children. Today about 60 percent of Canadian mothers with preschool children participate in the labour force, compared to only 30 percent in 1970. More than half return to work before their youngest child has reached the age of two.

Declining Birthrates There were 3.8 lifetime births per woman in 1957 at the peak of the baby boom. Today the number is less than 2. This marked decline in the size of the typical family, the result of changing lifestyles and the widespread availability of birth control, has freed up time for greater labour-force participation by women. Not only do women now have fewer children; their children are spaced closer together in age. Thus women who leave their jobs during their children's early years can return to the labour force sooner. Higher wage rates have also been at work. On average, women with relatively high wage earnings have fewer children than women with lower earnings. The opportunity cost of children—the income sacrificed by not being employed—rises as wage earnings rise. In the language of economics, the higher "price" associated with children has reduced the "quantity" of children demanded.

Rising Divorce Rates Marital instability, as evidenced by high divorce rates, may have motivated many women to enter and remain in the labour market. Because alimony and child support payments are often erratic or non-existent, the economic impact of divorce on non-working women may be disastrous. Most non-working women enter the labour force for the first time following divorce. And many married women—perhaps even women contemplating marriage—may have joined the labour force to protect themselves against the financial difficulties of potential divorce.

Slower growth of male wages The earnings of many low-wage and middle-wage male workers grew slowly or even fell in Canada over the past three decades. Many wives may have entered the labour force to ensure the rise of household living standards. The median income of couples with children grew 25 percent between 1969 and 1996. Without the mothers' income, that growth would have been only 2 percent. Couples of all income levels may be concerned about their family income compared to other families. So, the entry of some women into the labour force may have encouraged still other women to enter in order to maintain their families' *relative* standard of living.

Taken together, these factors have produced a rapid rise in the presence of women workers in Canada. This increase in the *quantity of resources* has helped push the Canadian production possibilities curve outward. In other words, it has contributed greatly to Canada's economic growth.

CHAPTER SUMMARY

1. Economics is grounded on two basic facts: (a) wants are virtually unlimited; (b) resources are scarce.
2. Resources may be classified as property resources—raw materials and capital—or as human resources—labour and entrepreneurial ability. These resources constitute the factors of production.
3. Economics is concerned with the problem of using scarce resources to produce the goods and services that satisfy the material wants of society. Both full employment and the efficient use of available resources are essential to maximize want satisfaction.
4. Efficient use of resources consists of productive efficiency (producing all output combinations in the least costly way) and allocative efficiency (producing the specific output mix most desired by society).
5. An economy that is achieving full employment and productive efficiency—that is operating on its production possibilities curve—must sacrifice the output of some types of goods and services in order to increase the production of others. Because resources are not equally productive in all possible uses, shifting resources from one use to another brings the law of increasing opportunity costs into play. The production of additional units of one product requires the sacrifice of *increasing* amounts of the other product.
6. Allocative efficiency means operating at the optimal point on the production possibilities curve. That point represents the highest-valued mix of goods and is determined by expanding the production of each good until its marginal benefit (MB) equals its marginal cost (MC).
7. Over time, technological advances and increases in the quantity and quality of resources enable the economy to produce more of all goods and services—that is, to experience economic growth. Society's choice as to the mix of consumer goods and capital goods in current output is a major determinant of the future location of the production possibilities curve and thus of economic growth.
8. The market system and the command system are the two broad types of economic systems

used to address the economic problem. In the market system (or capitalism) private individuals own most resources and markets coordinate most economic activity. In the command system (or socialism or communism), government owns most resources and central planners coordinate most economic activity.

9. The circular flow model locates the product and resource markets and shows the major real and money flows between businesses and households. Businesses are on the buying side of the resource market and the selling side of the product market. Households are on the selling side of the resource market and the buying side of the product market.

TERMS AND CONCEPTS

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capital goods, p. 31
circular flow model, p. 43
command system, p. 42
consumer goods, p. 31
economic growth, p. 38
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STUDY QUESTIONS

1. Explain this statement: "If resources were unlimited and were freely available, there would be no subject called *economics*."

2. Comment on the following statement from a newspaper article: "Our junior high school serves a splendid hot meal for $1 without costing the taxpayers anything, thanks in part to a government subsidy."

3. Critically analyze: "Wants aren't insatiable. I can prove it. I get all the coffee I want to drink every morning at breakfast." Explain: "Goods and services are scarce because resources are scarce." Analyze: "It is the nature of all economic problems that absolute solutions are denied to us."

4. What are economic resources? What are the major functions of the entrepreneur?

5. KEY QUESTION Why is the problem of unemployment part of the subject matter of economics? Distinguish between productive efficiency and allocative efficiency. Give an illustration of achieving productive, but not allocative, efficiency.

6. KEY QUESTION Here is a production possibilities table for war goods and civilian goods:

	PRODUCTION ALTERNATIVES				
Type of production	**A**	**B**	**C**	**D**	**E**
Automobiles	0	2	4	6	8
Rockets	30	27	21	12	0

a. Show these data graphically. Upon what specific assumptions is this production possibilities curve based?

b. If the economy is at point C, what is the cost of one more automobile? One more rocket? Explain how the production possibilities curve reflects the law of increasing opportunity costs.

c. What must the economy do to operate at some point on the production possibilities curve?

7. What is the opportunity cost of attending college or university? In 1999 nearly 80 percent of Canadians with post-secondary education held jobs, whereas only about 40 percent of those who did not finish high school held jobs. How might this difference relate to opportunity costs?

8. Suppose you arrive at a store expecting to pay $100 for an item but learn that a store two kilometres away is charging $50 for it.

Would you drive there and buy it? How does your decision benefit you? What is the opportunity cost of your decision? Now suppose you arrive at a store expecting to pay $6000 for an item but discover that it costs $5950 at the other store. Do you make the same decision as before? Perhaps surprisingly, you should! Explain why.

9. **KEY QUESTION** Specify and explain the shapes of the marginal-benefit and marginal-cost curves. How are these curves used to determine the optimal allocation of resources to a particular product? If current output is such that marginal cost exceeds marginal benefit, should more or fewer resources be allocated to this product? Explain.

10. **KEY QUESTION** Label point *G inside* the production possibilities curve you drew in question 6. What does it indicate? Label point *H outside* the curve. What does that point indicate? What must occur before the economy can attain the level of production shown by point *H*?

11. **KEY QUESTION** Referring again to question 6, suppose improvement occurs in the technology of producing rockets but not in the technology of producing automobiles. Draw the new production possibilities curve. Now assume that a technological advance occurs in producing automobiles but not in producing rockets. Draw the new production possibilities curve. Now draw a production possibilities curve that reflects technological improvement in the production of both products.

12. Explain how, if at all, each of the following events affects the location of the production possibilities curve:
    - **a.** Standardized examination scores of high school, university, and college students decline.
    - **b.** The unemployment rate falls from 9 to 6 percent of the labour force.
    - **c.** Defence spending is reduced to allow government to spend more on health care.
    - **d.** A new technique improves the efficiency of extracting copper from ore.

13. Explain: "Affluence tomorrow requires sacrifice today."

14. Suppose that, based on a nation's production possibilities curve, an economy must sacrifice 10,000 pizzas domestically to get the one additional industrial robot it desires, but that it can get the robot from another country in exchange for 9000 pizzas. Relate this information to the following statement: "Through international specialization and trade, a nation can reduce its opportunity cost of obtaining goods and thus 'move outside its production possibilities curve.' "

15. Contrast how a market system and a command economy respond to the economic problem.

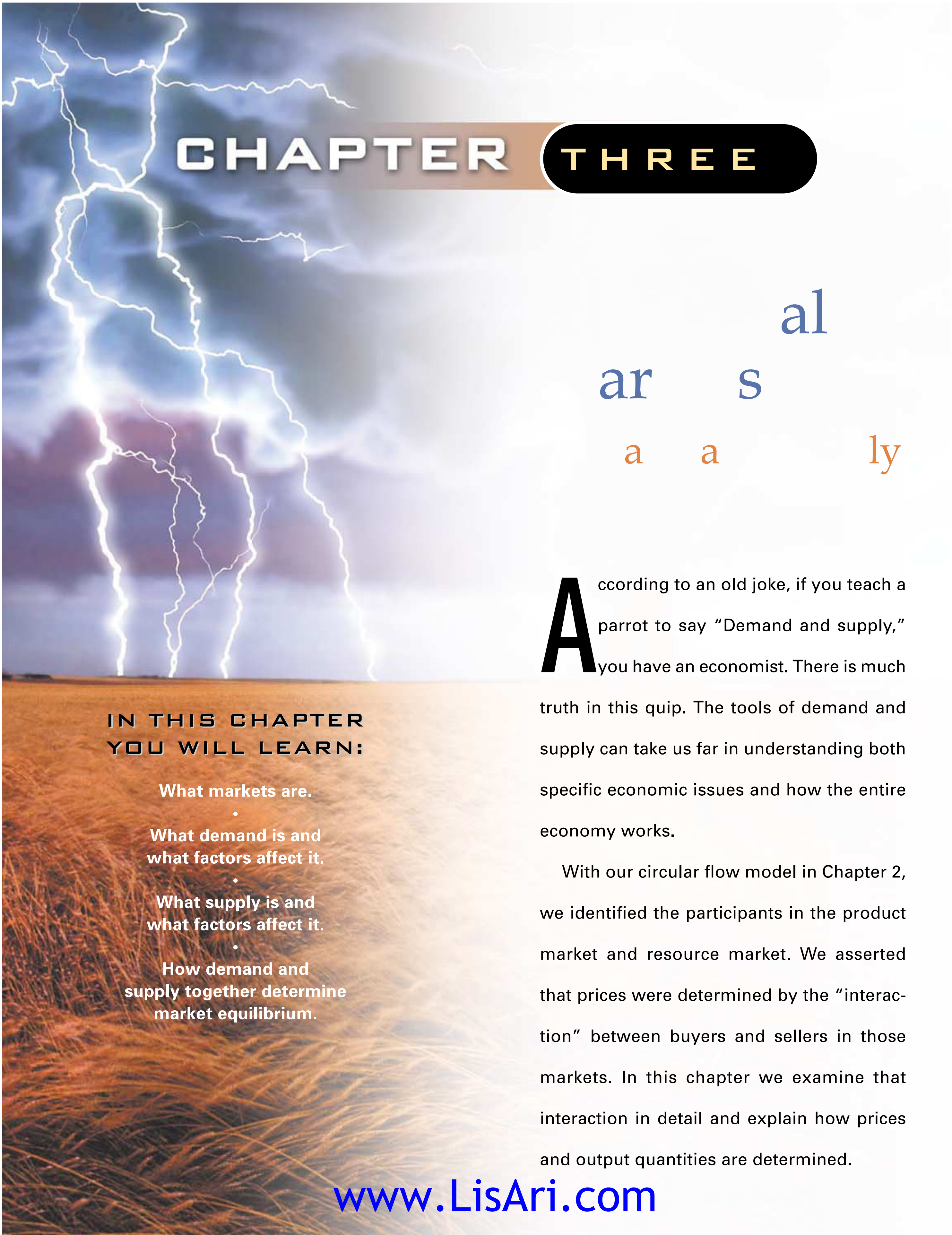
16. Distinguish between the resource market and product market in the circular flow model. In what way are businesses and households both *sellers and buyers* in this model? What are the flows in the circular flow model?

17. **(Last Word)** Which two of the six reasons listed in the Last Word do you think are the *most important* in explaining the rise in participation of women in the workplace? Explain your reasoning.

INTERNET APPLICATION QUESTIONS

1. **More Labour Resources—What is the Evidence for Canada and France?** Go to the U.S. Bureau of Labor Statistic's Web site www.bls.gov/ and click *Data* and then *Most Requested Series*. Click *International Labor Statistics* and retrieve Canadian employment data for the period of the last 10 years. How many more workers were there at the end of the 10-year period than at the beginning? Next find the total employment growth of Italy over the last 10 years. In which of the two countries did "more labour resources" have the greatest impact on the nation's production possibilities curve over the 10 years?

2. **Relative Size of the Military—Who's Incurring the Largest Opportunity Cost?** To obtain military goods, a nation must sacrifice civilian goods. Of course, that sacrifice may be worthwhile in terms of national defence and protection of national interests. Go to the U.S. Central Intelligence Agencies Web site www.odci.gov/cia/publications/factbook/country.html to determine the amount of military expenditures and military expenditures as a percentage of GDP, for each of the following five nations: Canada, Japan, North Korea, Russia, and the United States. Who is bearing the greatest opportunity costs?



CHAPTER THREE

al
ar s
a a ly

IN THIS CHAPTER YOU WILL LEARN:

- What markets are.
- What demand is and what factors affect it.
- What supply is and what factors affect it.
- How demand and supply together determine market equilibrium.

According to an old joke, if you teach a parrot to say "Demand and supply," you have an economist. There is much truth in this quip. The tools of demand and supply can take us far in understanding both specific economic issues and how the entire economy works.

With our circular flow model in Chapter 2, we identified the participants in the product market and resource market. We asserted that prices were determined by the "interaction" between buyers and sellers in those markets. In this chapter we examine that interaction in detail and explain how prices and output quantities are determined.

MARKETS

MARKET Any institution or mechanism that brings together buyers and sellers of particular goods, services, or resources for the purpose of exchange.

all ro a r 2 a a **market** s *an in i ion o mechani m ha b ing oge he b e (demande) and elle (lie) of a ic la good , e ice , o e o ce fo he o e of e change.* ar s s a y or s. or r as s a o , - o - r s s, lo al s s or , a ar r's roa s s a all ar a l ar ar- s. oro o o a a a o oar o ra ar ar s r y rs a s ll rs o s o s a o s a ar o o s ro all o r orl o a o a o r o y a s ll. o rs r o r o al y rs a s ll rs o ar , l s o , s ar , a , so s, r al s a . la o r ar s, ro ss o al o y lay r a s a ar a o r o a a . ra a a a or r- s a a a r al a o o r or o a a a r- s y la o .

www.tse.com Toronto Stock Exchange

ll s a o s a l o al y rs o al s ll rs ar ar s. o ar s ar lo al, l o rs ar a o al or r a o al. o ar ly r- so al, ol a - o- a o a a r a s l r o rs ar rso al, y r a s ll r r s or o a o r. o ss l , ll o s s a r o ar s o s s o lar rs o y rs a s ll rs o s a ar ro s. s ar ly o - ar s s as a ral ra a , a s o ar , or a ar or or rr s r s s o r ro ra - s o s o y rs a s ll rs. y ar *no* ar s o or a a l o ro rs s r s, s as ar s or o r al a r la s or o ra so ar or rso al o rs.

DEMAND

DEMAND A schedule or curve that shows the various amounts of a product that consumers are willing and able to purchase at each of a series of possible prices during a specified period of time.

all ro a r 2 a o o ro l o s s s o l a s a l r so r s o ro oo s a s r s o sa s y os a s. o o a a los r loo a a r o a s, or a . a r a r ll s a a r o s ly.

Demand *s a ched le o a c e ha ho he a io amo n of a od c ha con- me a e illing and able o cha e a each of a e ie of o ible ice d ing a eci- ed e iod of ime.*[1] a s o s a s o a ro a ll r as a ar o s oss l r s, *o he hing e al.* a a as ly s o a l or . a l -1 s a y o al **demand schedule** or a *ingle con me* r as s ls o or .

a l -1 r als r la o s ar o s r s o or a a y o or a ar lar o s r o l ll a a l o r as a a o s r s. say ll a *able* a s ll ss alo s o - ar . o ay ll o y a ors , a ll ss s o a y ssary ollars, ll o a , r or , ll o r ar . a l -1, r o or as $ r s l, o r o - s r o l ll a a l o y 10 s ls r as $, o - s r o l ll a a l o y 20 s ls r a so or .

---

[1] This definition obviously is worded to apply to product markets. To adjust it to apply to resource markets, substitute the word "resource" for "product" and the word "businesses" for "consumers."

TABLE 3-1 AN INDIVIDUAL BUYER'S DEMAND FOR CORN

Price per bushel	Quantity demanded per week
$5	10
4	20
3	35
2	55
1	80

a l -1 o s o ll s o os- s l r s ll a ally s or ar . a s o a a s ly. a ss ly as a o a y r's la s, or - o s, r s o r as o a ro . o a l, a s a a a r s r la o as ro a ay, a , a o . ay o s r ll y 10 s ls o or a $ r s l s a l ss. ay o s r ll y 10 s ls o or r a $ r s l s a l. l ss a s ro s s a , o o o r a or a ro s lar or s all.

Law of Demand

LAW OF DEMAND The principle that, other things equal, an increase in a product's price will reduce the quantity of it demanded; and conversely for a decrease in price.

MARGINAL UTILITY The extra utility a consumer obtains from the consumption of one additional unit of a good or service.

INCOME EFFECT A change in the price of a product changes a consumer's real income (purchasing power) and thus the quantity of the product purchased.

SUBSTITUTION EFFECT A change in the price of a consumer good changes the relative expensiveness of that good and hence changes the willingness to buy it rather than other goods.

a al ara r s o a s s *All el e e al, a ice fall , he an- i demanded i e , and a ice i e , he an i demanded fall .* s or , r s a a or *in e e* r la o s r a a y a . s rs r la o s s all **law of demand**.

o r s al ass o s r al r . a y a ors o r a r o ro o s r a a o r as . a y o s r as ll o o ly o r o s also o r s o s s s s as o s, as, a las. la o a s as says a r s ll r as r o s r s s *and if he ice of Reebok , Adida , and Fila all emain con an .* s or , *ela i e ice* o s r s s, r s ll o . o r, r o s a all o r o s o s r as y so a o say, $ o s rs y or , r, or sa a o o s.

y rs r la o s r a a y a 's loo a o la a o s

- a y s ro , a y r o a ro ll r l ss sa s a - o (or , or l y) ro a s ss o ro o s . s o a ll y l l ss sa s a o o o s r a rs , a r s ll l ss a s o . a s, o s o s s o s **marginal utility**. a s s ss s o a ar lar ro y l l ss a l ss ar al l y, o s rs ll y a o al s o ly r o os s s ro r ss ly r .
- a also la la o a r s o o a s s o s. **income effect** a s a a lo r r r as s r as- o ro a y r's o y o , a l y r o r as or o ro a s or o l y or . r r as o os . **substitution effect** s s s a a a lo r r , y rs a o s s a s o a l ss s ro or s lar ro - s a ar o *ela i el* or s . ro os r as all s o a r al r la o o r ro s.

or a l , a l r o ll r as r as o r o o s r o s, a l o y or (o). a lo r r , s r la ly or a ra a o s rs o s s or or , o , , a s (s s o). o a s s- o s o o a o s rs a l a ll o y or o a ro- a a lo r a a a r .

The Demand Curve

rs r la o s r a a y a or a y ro a r r s o a s l ra , , y o o , as r *an i demanded* o or o al a s a *ice* o r al a s. r -1 a lo r - a y a a o s l s a l -1 a o o s a s oo r , la ll *D*. a r s all a **demand curve**. s o ar slo r s la o a or o l y or o a ro , s r , or r so r , as s r alls. r la o s r a a y a s rs .

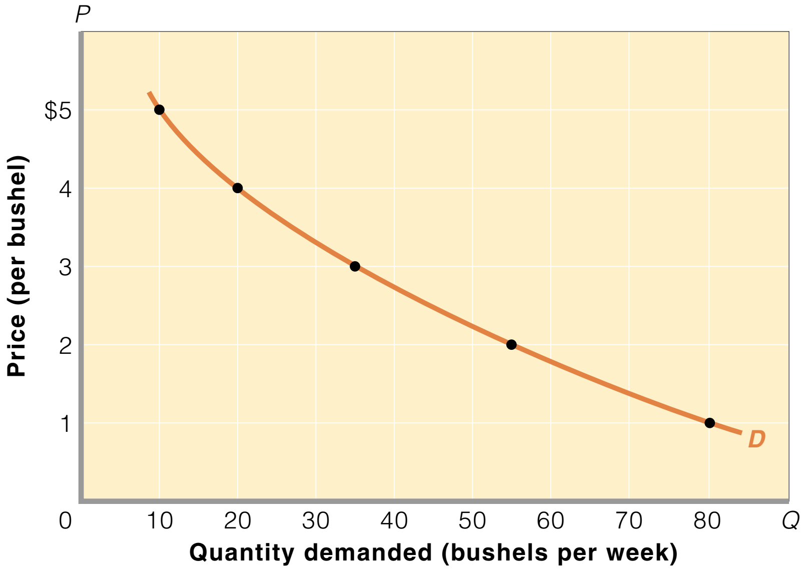
a l -1 a r -1 o a a ly sa a a a r sa r la- o s r a a y a . ra s o s a r la o- s or s ly a l arly a a a l or a s r o or s.

DEMAND CURVE A curve illustrating the inverse (negative) relationship between the quantity demanded of a good or service and its price, other things equal.

Market Demand

o ar, a o ra o s o o s r. y a a s a y all o s rs a a o ar o s oss l r s, a ro *indi id al* a o *ma ke* a . r ar s r y rs ar , as r r s a l -2, s r la ly asy o r o al a y a a a r . r -2 s o s ra al s ro r a r a al a s a o o a o al a y a a a r lo r a o al a y a as o o o ar a r .

FIGURE 3-1



Because price and quantity demanded are inversely related, an individual's demand schedule graphs as a down-sloping curve such as *D*. Specifically, the law of demand says that, other things equal, consumers will buy more of a product as its price declines. Here and in later figures, *P* stands for price, and *Q* stands for quantity (either demanded or supplied.)

TABLE 3-2 MARKET DEMAND FOR CORN, THREE BUYERS

Price per bushel	Quantity demanded First buyer		Second buyer		Third buyer		Total quantity demanded per week
$5	10	+	12	+	8	=	30
4	20	+	23	+	17	=	60
3	35	+	39	+	26	=	100
2	55	+	60	+	39	=	154
1	80	+	87	+	54	=	221

o rs , r ar s ally a y or a r y rs o a ro . o a o r s or o sa s or ll o s o a o s, s os a all y rs a ar ar ll a a l o y sa a o s a a o oss l r s. s l ly os a o s y r o y rs o o a ar a . s s ay arr a r D_1, r - , or a ar 200 or y rs os a s a s o a l -1. a l - s o s al la o s.

o s r a a r s as D_1 r - , ass a r s os or a o a o o a y ro - r as , o o r a ors a a o a r as s. s a ors, all **determinants of demand**, ar ass o o - s a a a r l D_1 s ra . y ar o r s al r la o s r a a y a . a y o s r- a s a s, a r ll s o r or l . or s r aso , r a s o a ar so s r rr o as *demand hif e* . as r a s o a ar (1) o s rs' as s (r r s), (2) r o o s rs ar , ( ) o s rs' o s, ( ) r s o r la oo s, a ( ) o s r a o s a o r r s a o s.

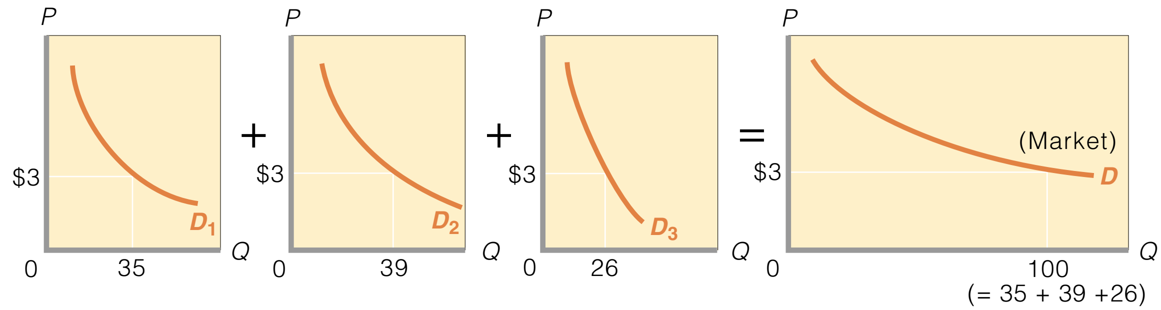
DETERMINANTS OF DEMAND Factors other than its price that determine the quantities demanded of a good or service.

Change in Demand

a o or or o r a s o a ll a a a a (a s l) a l - a r or lo a o o a r r - . a a s l , or ra ally, a s a r , s all a *change in demand*.

o s rs s r o y or or a a oss l r a s r ol- a l - , a *inc ea e in demand* s s o as a s o a r o r , say, ro D_1 o D_2. o rs ly, a *dec ea e in demand* o rs o s rs

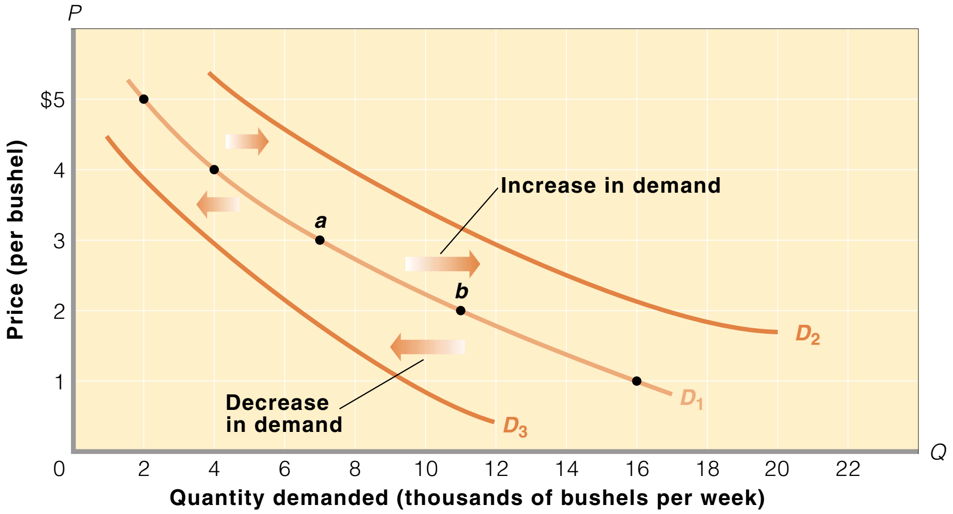
FIGURE 3-2



We establish the market demand curve D by adding horizontally the individual demand curves (D_1, D_2, and D_3) of all the consumers in the market. At the price of $3, for example, the three individual curves yield a total quantity demanded of 100 bushels.

FIGURE 3-3 CHANGES IN THE DEMAND FOR CORN

A change in one or more of the determinants of demand causes a change in demand. An increase in demand is shown as a shift of the demand curve to the right, as from D_1 to D_2. A decrease in demand is shown as a shift of the demand curve to the left, as from D_1 to D_3. These changes in demand are to be distinguished from a change in quantity demanded, which is caused by a change in the price of the product, as shown by a movement from, say, point *a* to point *b* on fixed demand curve D_1.



y l ss or a a oss l r a s a ol , a l - . l - ar s o a r ro D_1 o D r - s o s a s a o . o l 's s o a s a r a a a .

TASTES

a o ra l a o s r as s (r r s) or a ro a a a a s ro or s ra l a s a or o ll a a a r . a ll r as a r ll s r ar . a o ra l a o s r r r s ll r as a , s a r o l .

ro s ay a o s r as s or a l , ro o o o - a s s r a ly r as a or ass a s. o s rs' o r o r al a ar s o ol s rol a o - s y a r as a or ro ol , lo - alor s rs, a r s r , l r as a or , al, s, a ol l . r as s ral y ars, a or o r s, o l a r, a s or s l y l s as r a ly r as , r y a a as s. o, oo, as a or ar o a s a o r ar.

TABLE 3-3 MARKET DEMAND FOR CORN, 200 BUYERS

(1) Price per bushel	(2) Quantity demanded per week, single buyer		(3) Number of buyers in the market		(4) Total quantity demanded per week
$5	10	×	200	=	2,000
4	20	×	200	=	4,000
3	35	×	200	=	7,000
2	55	×	200	=	11,000
1	80	×	200	=	16,000

NUMBER OF BUYERS

r as r o y rs a ar r as s a . r as r o y rs a ar r as s a . or a l , a y oo a r orl ar r as a or a rs, a y lo o , a s r s o o s r a s. a y oo rs r a r 20s 1 0s, a or o s r as . o- rs ly, a o a y oo rs 1 0s a 1 0s as a a or r l- a sl a or o s os a s. lso, a r as l a y as r as a or al ar , r r o s, a rs o s. r a o al ra a r s a r or ra ar- r rs o a a a ar o o s, s r as a or os ro s.

INCOME

o a s o a a s or o l . or os ro s, a r s o a s s a r as a . o s rs y ally y or s a s, r- r , a o rs as r o s r as . o rs ly, a or s ro s l s as o alls. ro s or a ar s *di ec l* o y o ar all **normal goods**. l o os ro s ar or al oo s, r ar so o s. s o s r as yo so o , a or s lo , r r a r s, a r- a a o o l s ay r as , a s r o s a l o s rs o y rs o s o os ro s. s o s ay also r as a or soy- a a r rs. larly, r s o s ay a s a or ar oal r lls o l as al r o s rs s o as r lls. Goo s or a ar s *in e el* o y o ar all **inferior goods**.

NORMAL GOOD A good or service whose consumption rises when income increases and falls when income decreases, price remaining constant.

INFERIOR GOOD A good or service whose consumption declines as income rises (and conversely), price remaining constant.

PRICES OF RELATED GOODS

a r o a r la oo ay r r as or r as a or a ro , o r r la oo s a s s or a o l .

- **substitute good** s o a a s la o a o r oo .
- **complementary good** s o a s s o r a o r oo .

SUBSTITUTE GOODS Products or services that can be used in place of each other.

COMPLEMENTARY GOODS Products and services that are used together.

Substitutes

a ar a l s o s s oo s, or s ly *b i- e .* r o r s s, o s rs y l ss , r as a or . o rs ly, as r o alls, o s rs y or , r as- a or . *When o od c a e b i e , he ice of one and he demand fo he o he mo e in he ame di ec ion.* o s a rs s as s a o s, ol a a r s , oyo as a o as, a o a s . o- all *b i ion in con m ion* o rs r o o oo r s s r la o r o a s lar oo .

Complements

o l ary oo s (or s ly *com lemen*) ar oo s a ar s o r a ar s ally a o r. r o asol alls a , as a r s l , yo r yo r ar or o , ra r r as s yo r a or o or o l. s, as a o or o l ar o ly a y ar o l s. o s a a s, o a oo s, o s a o or , a ras a l . *When o od c a e com lemen , he ice of one good and he demand fo he o he good mo e in o o i e di ec ion .*

Unrelated Goods

as a or y o oo s a ar o r la oo a o r ar all *inde enden good* . a l s ar r a ol alls, o a o s a a o o- l s, a a a as a r s a s. a r o o o s o a a or o r.

Expectations

a s o s r a o s ay s a . ly or a o o r r r s ay a s o s rs o y o or r o a a a r r s s, s r as rr a . or a l , r a r s roys o lor a's r s ro , o s rs ay r aso a r o ora ll r s . y ay s o o ora y r as lar a s o . o ras , a ly or a o o all r s or all o ay r as rr a or ro s.

larly, a a a o s r la o r ro a a la l y ay a rr a . la r 1 r as a s s a al r as a or asol . aso o or s s a o r a 2 o r ro l sr l s or r ar sys s.

ally, a a a o s o r r o ay ro o - s rs o a r rr s . or a l , rs -ro ra o s ay s l r o l ry ars a a o o a l ra ro ss o al o y o ra . r or rs o o ar l o los r o s ay r r a or, say, a a o ra l.

s ary, a *inc ea e* a s o y o s rs o y lar r a s o a ro a a oss l r ay a s y

- a o ra l a o s r as s
- r as r o y rs
- s o s ro s a or al oo
- all o s ro s a r or oo
- r as r o a s s oo
- r as r o a o l ary oo
- o s r a o a r s a o ll r r

o s o l r rs s ral a o s o la a *dec ea e* a . a l - ro s a o al ll s ra o s o r a s o a . (*Key Question* 2)

TABLE 3-4 DETERMINANTS OF DEMAND: FACTORS THAT SHIFT THE DEMAND CURVE

Determinant	**Examples**
Change in buyer tastes	Physical fitness rises in popularity, increasing the demand for jogging shoes and bicycles; Latin American music becomes more popular, increasing the demand for Latin CDs.
Change in number of buyers	A decline in the birthrate reduces the demand for children's toys.
Change in income	A rise in incomes increases the demand for such normal goods as butter, lobster, and filet mignon while reducing the demand for such inferior goods as cabbage, turnips, and inexpensive wine.
Change in the prices of related goods	A reduction in airfares reduces the demand for bus transportation (substitute goods); a decline in the price of compact disc players increases the demand for compact discs (complementary goods).
Change in expectations	Inclement weather in South America creates an expectation of higher future prices of coffee beans, thereby increasing today's demand for coffee beans.

Changes in Quantity Demanded

CHANGE IN DEMAND A change in the quantity demanded of a good or service at every price; a shift of the demand curve to the left or right.

CHANGE IN QUANTITY DEMANDED A movement from one point to another on a demand curve.

change in demand s o o s a *change in an i demanded.* **change in demand** s a s o r a r o r (a r as a) or o l (a r as a). o rs a s o s r's s a o a o r as ro as al r r s o s o a a o or or o r a s o a . all a *demand* s a s l or a r r or , a *change in demand* a s a a r s l a a s o r r .

o ras , a **change in quantity demanded** s a o ro o o o a o r o ro o r - a y o a o o a o r o a a s l or a r . a s o s a a s a r as or r as r o ro r o s ra o . a l - , or a l , a l r o or ro $ o $ ll r as a y o or a ro 2000 o 000 s ls.

r - s o a r D_1 o r D_2 or D s a a a . o ro o *a o o b o* r D_1 r r s s a a a y a *demand ha no changed; i i he en i e c e, and i emain ed in lace.*

QUICK REVIEW

- A market is any arrangement that facilitates the purchase and sale of goods, services, or resources.
- Demand is a schedule or a curve showing the amount of a product that buyers are willing and able to purchase at each possible price in a series of prices, in a particular time period.
- The law of demand states that, other things equal, the quantity of a good purchased varies inversely with its price.
- The demand curve shifts because of changes in (a) consumer tastes, (b) the number of buyers in the market, (c) consumer income, (d) the prices of substitute or complementary goods, and (e) consumer expectations.
- A change in demand is a shift of the entire demand curve; a change in quantity demanded is a movement from one point to another on a demand curve.

SUPPLY

SUPPLY A schedule or curve that shows the amounts of a product that producers are willing and able to make available for sale at each of a series of possible prices during a specific period.

o s o a o ra o ra o o a r o a s. or r or a s o sa s so o s ro oo s a s r s s r . o r o s a a r o s ly.

Supply *s a ched le o c e ha ho he amo n of a od c ha od ce a e illing and able o make a ailable fo ale a each of a e ie of o ible ice d ing a eci c e iod.*[2] a l - s a y o al **supply schedule** or a s l ro r o or . s o s a s o or a ll s l a ar o s r s, o r s al.

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[2] This definition is worded to apply to product markets. To adjust it to apply to resource markets, substitute *resource* for *product* and *owner* for the word *producer*.

TABLE 3-5 AN INDIVIDUAL PRODUCER'S SUPPLY OF CORN

Price per bushel	Quantity supplied per week
$5	60
4	50
3	35
2	20
1	5

Law of Supply

LAW OF SUPPLY The principle that, other things equal, an increase in the price of a product will increase the quantity of it supplied; and conversely for a price decrease.

a l - s o s a r r la o s r a a y s l . *A ice i e , he an i lied i e* ; *a ice fall , he an i lied fall* . s r la o s s all **law of supply**. s ly s l lls s a r s ll ro a o r or sal or o r ro a a r a a a lo r . r s a o s a l ro s a o o o s r, o s o ay . r r , l ss o s r ll y. s l r s o r o ro 's r . o a s l r, r r r s s *e en e*, s r s as a o ro a s lla ro . r r , r a r a r a r a y s l .

o s r a ar r o a s r so r s a o al r a ar ro s. s r o s , as s o a l - , ar r s ro a l o a la o o a , oa s, a soy a ro o a o or . r or r s a l ar r o o r r as os s asso a or s l a o a s o or s , r l r, a s s. o rall r s l s or or .

o o s r a a r r. yo so a y o ro o , a a-r rs s ally o r r as os s r a o o . r a ro-r so r s ar lar, r 's la a a ry a o a ly. o r s s or o o r r so r s, s as la o r, o ro or o . as ass s, s la o s r as ly ro a o s . s ar s l , a a or r ro s l ss a o - , a os o s ss s o o r s s a or ly. r ll o ro os or os ly s l ss r s a r r or . a , r a a y s l ar r ly r la .

The Supply Curve

SUPPLY CURVE A curve illustrating the positive (direct) relationship between the quantity supplied of a good or service and its price, other things equal.

s a , s o o r r s s ly ra ally. r - , r S_1 s a ra o ar s ly a a a l - . os a a ass r ar 200 s l rs ar , a ll a a l o s ly or a or - o a l - . o a ar **supply curve** y or o ally a s - ly r s o al ro rs. o a a s r - ar sa as os s o r ra o ar a (r -), or a ro a y a o a y s l o or o al a s.

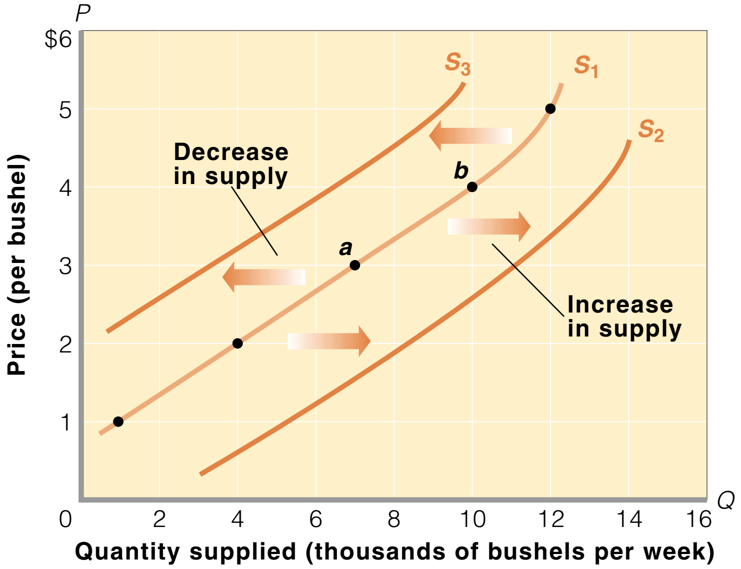
Determinants of Supply

DETERMINANTS OF SUPPLY Factors other than its price that determine the quantities supplied of a good or service.

o s r a s ly r , ass a r s os s a - o a y s l o a y ro . o r a ors (o r s al) a a o a s ly. s ly r s ra o ass o a s o r s ar a o o a . o o o s a , a *change in* l ll o r, a a r s ly r ll s . as **determinants of supply** ar (1) r so r r s, (2) olo y, ( ) a s a s s s, ( ) r s o o r oo s, ( ) r a o s, a ( ) r

FIGURE 3-4 CHANGES IN THE SUPPLY OF CORN

A change in one or more of the determinants of supply causes a shift in supply. An increase in supply is shown as a rightward shift of the supply curve, as from S_1 to S_2. A decrease in supply is depicted as a leftward shift of the curve, as from S_1 to S_3. In contrast, a change in the *quantity supplied* is caused by a change in the product's price and is shown by a movement from one point to another, as from *a* to *b*, on a fixed supply curve.



o s ll rs ar . a a y o or or o s r a s o s -
ly, or *l hif e* , ll o s ly r or a ro r o r or
o l . s o *igh* , as ro S_1 o S_2 r - , s s a *inc ea e*
s ly ro rs s ly lar r a s o ro a a oss l r .
s o *lef* , as ro S_1 o S , a s a *dec ea e* s ly. ro rs o r l ss
o a a r .

Changes in Supply

's o s r o a s a o r a s a s ly. y a
s a os s ar a a or a or rly s ly r s a y a a s os s
(o r a a s o s l) s ally
s s s ly r .

TABLE 3-6 MARKET SUPPLY OF CORN, 200 PRODUCERS

(1) Price per bushel	(2) Quantity supplied per week, single producer		(3) Number of sellers in the market		(4) Total quantity supplied per week
$5	60	×	200	=	12,000
4	50	×	200	=	10,000
3	35	×	200	=	7,000
2	20	×	200	=	4,000
1	5	×	200	=	1,000

RESOURCE PRICES

r s o r so r s s as s
ro o ro ss l r os s o
ro o rr y r s. r *e o ce*
r s ra s ro o os s a , ass a
ar lar *od c* r , s ro s. a
r o ro s r s or
r s o s ly o a a ro r .
or a l , a r as r s o ro
or a o ll r as os o ro
s l a r s s ly.
o ras , lo r *e o ce* r s r ro-
o os s a r as ro s. o,
r so r r s all, r s s ly r a r o

a a ro r . or a l , a r as r s o s a r l r ll r as s ly o or .

TECHNOLOGY

ro s olo y (s o ro o) a l r s o ro s o o r r so r s. a s r so r s ar os ly, s r o lo rs ro o os s a r as s s ly. a l ro - s l y o a r ra s a r os o ro ass r a r s r . s, a rl s o o r or s a r o sly a a r s ly o a r s r as r as .

TAXES AND SUBSIDIES

s ss r a os a s as os s. r as sal s or ro r y a s ll r as ro o os s a r s ly. o ras , s s s ar a s r rs . o r s s s ro o o a oo , lo rs ro - rs’ os s a r as s s ly.

PRICES OF OTHER GOODS

r s a ro a ar lar ro , say, so r alls, a so s s r la a o ro al r a oo s, say, as alls a oll y alls. r r so s o r oo s ay so r all ro rs o s ro o o os o r oo s or r o r as ro s. s *b i ion in o- d c ion* r s l s a l s ly o so r alls. l r a ly, r s o as alls a oll y alls l r la o r o so r alls, ro- rs o os oo s ay o ro or so r alls s a , r as r s ly.

PRICE EXPECTATIONS

a s a o s a o r r o a ro ay a ro r’s rr ll ss o s ly a ro . s l , o r, o ral a o o a a o o r r s a s r s s ly o a ro - . ar rs a a a r or r r ol so o r rr or ar s ro ar , r y a s a r as rr s ly o or . larly, o l s ly a r o or l s o ll r s s a ly ar r , s ly o r or sal o ay r as . o ras , a y y s o a a r s r s, ly or a o s a r ll r as ay r s o a a o r s o or rs or o a r ro o a l s, a s rr s ly o r as .

NUMBER OF SELLERS

r s al, lar r r o s l rs, r a r ar s ly. s or r s r a s ry, s ly r s s o r . o rs ly, s all r r o r s s ry, l ss ar s ly. s a s a as r s l a a s ry, s ly r s s o l . a l a a a a a s a os r s r o s o a o s o r l s l s o s. s ar o a ol y, ral o r as o oa s o so o a o s r as a ay o o o s ss a r as a . r s l as a l ar s ly o a o . a l - s a l s o r a s o s ly, alo r r ll s ra- o s. (***Key Question 5***)

TABLE 3-7 DETERMINANTS OF SUPPLY: FACTORS THAT SHIFT THE SUPPLY CURVE

Determinant	Examples
Change in resource prices	A decrease in the price of microchips increases the supply of computers; an increase in the price of crude oil reduces the supply of gasoline.
Change in technology	The development of more effective wireless technology increases the supply of cell phones.
Changes in taxes and subsidies	An increase in the excise tax on cigarettes reduces the supply of cigarettes; a decline in subsidies to universities reduces the supply of higher education.
Change in prices of other goods	An increase in the price of cucumbers decreases the supply of watermelons.
Change in expectations	An expectation of a substantial rise in future log prices decreases the supply of logs today.
Change in number of suppliers	An increase in the number of Internet service providers increases the supply of such services; the formation of women's professional basketball leagues increases the supply of women's professional basketball games.

Changes in Quantity Supplied

s o a *change in* *l* a a *change in* *an i* *lied* arall ls s o a a a a a a a y a . a s s ly s a s l or r , a **change in supply** a s a a r s l a a s o r r . r as s ly s s r o r a r as s ly s s o l . a s o a a s - ly s a a o or or o r a s o s ly. o ras , a **change in quantity supplied** s a o ro o o o a o r o a s ly r . a s o s a o s a a r o s ro o s r . a l - , a l r o or ro $ o $ r as s a y o or s l r ro 12,000 o 10,000 s ls. s s a a a y s l , o a a s ly. *S - l i he f ll ched le of ice and an i ie ho n, and hi ched le doe no change hen ice change* .

CHANGE IN SUPPLY A change in the quantity supplied of a good or service at every price; a shift of the supply curve to the left or right.

CHANGE IN QUANTITY SUPPLIED A movement from one point to another on a fixed supply curve.

QUICK REVIEW

- A supply schedule or curve shows that, other things equal, the quantity of a good supplied varies directly with its price.
- The supply curve shifts because of changes in (a) resource prices, (b) technology, (c) taxes or subsidies, (d) prices of other goods, (e) expectations of future prices, and (f) the number of suppliers.
- A change in supply is a shift of the supply curve; a change in quantity supplied is a movement from one point to another on a fixed supply curve.

SUPPLY AND DEMAND: MARKET EQUILIBRIUM

TABLE 3-8 MARKET SUPPLY OF AND DEMAND FOR CORN

(1) Total quantity supplied per week	(2) Price per bushel	(3) Total quantity demanded per week	(4) Surplus (+) or shortage (–)
12,000	$5	2,000	+10,000↓
10,000	4	4,000	+ 6,000↓
7,000	3	7,000	0
4,000	2	11,000	– 7,000↑
1,000	1	16,000	–15,000↑

arro s a o r .

a o r o rs ly a a o s o y s o s o o s ol s a s ll s o s o s ss s ra o r r o a ro a a y a ally o a sol . a l - , ol s 1 a 2 r a ar s ly o or (ro a l -), a ol s 2 a r a ar a or or (ro a l -). ass a s s a o ar- r y rs or s ll rs a s r .

Surpluses

a l o r a l o o ly os- s l r s. s , ll a ally r - a l as ar r or or a a a s r ro r al a rror. or o ar - lar r aso , l 's s ar $. s - a ly a s a o r a l ar r . $ r , ro rs ar ll o ro a o r or sal 12,000 s ls o or , y rs ar ll o y o ly 2000 s ls. $ r o ra s ar rs o ro lo s o or s o ra s os o s rs ro y . r s l s a 10,000- s l **surplus** or *e ce l* o or . ss r l s, s o ol o a l - , s ss o a y s l o r a y a a $. or ar rs o l s l s 10,000 sol s ls o o .

SURPLUS The amount by which the quantity supplied of a product exceeds the quantity demanded at a specific (above-equilibrium) price.

The Effectiveness of Markets

r o $, s orar ly or ar , o l o rs s o r a r o o . ry lar s r l s o or o l r o s ll rs o lo r r o o ra y rs o a s r l s o r a s. os r o s o o $. lo r r o ra s o s rs o y or or a , a sa , s ar rs o o r l ss o or sal . s r- l s s s o 000 s ls. r l ss, s r ss ll a s r l s, o - o a o s ll rs ll o a a r r . l arly, , r s o $ a $ ll o s r a s y ar oo . ar r o or s l ss a $.

Shortages

's o o $1 as oss l ar r o or . s r ol o a l - a a s r , a y a s a y s l y 1 ,000 s. $1 r s o ra s ar rs ro o r so r s o or ro o a o ra s o s rs o a o y or a s a a la l . r s l s a 1 ,000- s l **shortage** o , or *e ce demand* or, or . $1 r a o rs s as ar r . a y o s rs o a o y a s r ll o or . y ll r ss a ll ss o ay or a $1 o so o a a la l o - . o o a o s y rs ll r r o so r a r a $1.

SHORTAGE The amount by which the quantity demanded of a product exceeds the quantity supplied at a particular (below-equilibrium) price.

os o o a o y rs oos s r o $2. s r r ll r , ll o l a , s or a o or . or $2, ar rs o or r so r s o or ro o , a so y rs o r ll o ay $1 r s l ll o a o y or a $2. a s or a o 000 s ls s ll s s a $2. s s or a ll s ar r a o $2.

Equilibrium Price and Quantity

EQUILIBRIUM PRICE The price in a competitive market at which the quantity demanded and the quantity supplied are equal.

EQUILIBRIUM QUANTITY The quantity demanded and supplied at the equilibrium price in a competitive market.

y r al a rror a l a ry r $. $, *and onl a hi ice,* a y o or a ar rs ar ll o ro a s ly s al a y o s rs ar ll a a l o y. r s r a s or a or a s r l s o or a a r . os or a ors r l sa $, r s or aso or r o or o a . o o s s all s r *ma ke -clea ing* or **equilibrium price**, l r a ala or a r s . $, a y s l a a y a ar ala a **equilibrium quantity** o 000 s ls. o $ s o ly s a l r o or r s ly a a o o s s o a l - . r o or , or o a y o r ro o a sol o ar- s, ll s a l s r s ly s o s o ro rs a a s o s o y rs ar ally o s s . s o s ar o s s o ly a l r r (r , $) a l r a y (r , 000 s ls). a y r r , s l rs a os ll or a o s rs a o y a a s r l s r s l s a a y lo r r , o s rs a o y or a ro rs a a al- a l or sal a a s or a r s l s. s r a s s ly a a o s o s ll rs a y rs ro r a s a r o s s o o s o a or .

ra al a alys s o s ly a a s o l y l s sa o l s o s. **igure -5 (ey Graph)** s o s ar s ly a a r s or or o sa ra . (or o al a s o as r s o a y a a a y s l .)

G a hicall , he in e ec ion of he l c e and he demand c e fo a od c indi- ca e he ma ke e ilib i m. r , l r r a a y ar $ r s l a 000 s ls. a y a o - l r r , a y s l s a - y a . s s r l s o or a s s r r o s y s ll rs o ar a r o r s l s o r s r l s. all r a s s l ss or o o r a s l a o sly o ra s o s rs o y or . ar o s o s l r .

y r lo l r r r a s a s or a a y a s a y s l . y rs ry o o a ro y o r o ay or or s r s r ar o ar s l r l l. r s r s l a o sly a s s ro rs o r as a y s l a ro s a y y rs o l a ar , s l a s or a . a ar o s o s l r .

RATIONING FUNCTION OF PRICES The ability of market forces in a competitive market to equalize quantity demanded and quantity supplied and to eliminate shortages via changes in prices.

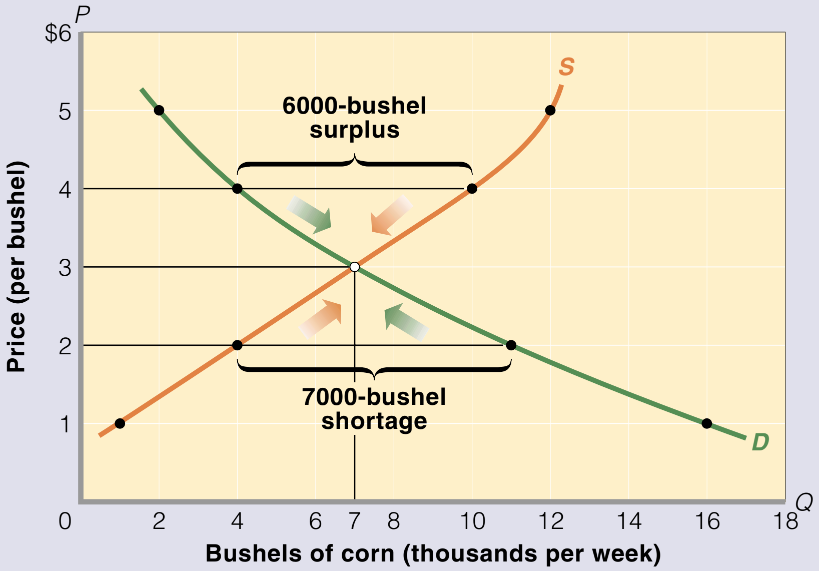
Rationing Function of Prices

a l y o o or s o s ly a a o s a l s a r a s ll a y s o s ar o s s s all **rationing function of prices**. o r as , l r r o $ l ars ar , l a o r- so s r l s ors ll rs a o o s or a or o al y rs. s o a o o r ly a al s o s a s s s ar - l ar r . , ar o o says a all y rs o ar ll a a l o ay $ or a s l o or ll o a all y rs o a o or ll o

Key Graph

FIGURE 3-5 EQUILIBRIUM PRICE AND QUANTITY

The intersection of the downsloping demand curve *D* and the upsloping supply curve *S* indicates the equilibrium price and quantity, here $3 and 7000 bushels of corn. The shortages of corn at below-equilibrium prices (for example, 7000 bushels at $2), drive up price. These higher prices increase the quantity supplied and reduce the quantity demanded until equilibrium is achieved. The surpluses caused by above-equilibrium prices (for example, 6000 bushels at $4), push price down. As price drops, the quantity demanded rises and the quantity supplied falls until equilibrium is established. At the equilibrium price and quantity, there are neither shortages nor surpluses of corn.



QUICK QUIZ

1. Demand curve *D* is downsloping because:
- a. producers offer less product for sale as the price of the product falls.
- b. lower prices of a product create income and substitution effects, which lead consumers to purchase more of it.
- c. the larger the number of buyers in a market, the lower the product price.
- d. price and quantity demanded are directly (positively) related.

2. Supply curve *S*:
- a. reflects an inverse (negative) relationship between price and quantity supplied.
- b. reflects a direct (positive) relationship between price and quantity supplied.
- c. depicts the collective behaviour of buyers in this market.
- d. shows that producers will offer more of a product for sale at a low product price than at a high product price.

3. At the $3 price
- a. quantity supplied exceeds quantity demanded.
- b. quantity demanded exceeds quantity supplied.
- c. the product is abundant and a surplus exists.
- d. there is no pressure on price to rise or fall.

4. At price $5 in this market:
- a. there will be a shortage of 10,000 units
- b. there will be a surplus of 10,000 units.
- c. quantity demanded will be 12,000 units
- d. quantity demanded will equal quantity supplied.

Answers:

1. b; 2. b; 3. d; 4. b

ay $ ll o o or . larly, all ro rs o ar ll a a l o o r or or sal a $ a s l ll s ll all ro rs o a o or ll o s ll or $ r s l ll o s ll r ro . (*Key Question 7*)

Changes in Supply, Demand, and Equilibrium

o a a a a s o a o s o s r as s or o s, a s o s r a o s, or ar a o s r s o r la oo s. ly a r s o s o a s r so r r s, olo y, or a s. a s ll s a s s ly a a a o l r r a a y

CHANGES IN DEMAND

os a s ly s o s a a a r as s, as s o r - (a). s a r s l , rs o o s ly a a r s s a r al- so o r a a y a s. r as a ras s o l - r r a l r a y. o rs ly, a r as a , s as a s o r - ( ), r s o l r r a l r a y. (al o ra al a alys s s o a ar o l ol s o r s o r o o s o ly o ar a ol o s o rs o o ra .)

CHANGES IN SUPPLY

o s os a a s o s a s ly r as s, as r - ( ). rs o o s ly a a s lo a a a lo r l r r a a r l r a y. r as s ly r s l r r r as s l r a y. o ras , s ly r as s, as r - ( ), l r r rs s l l r a y l s.

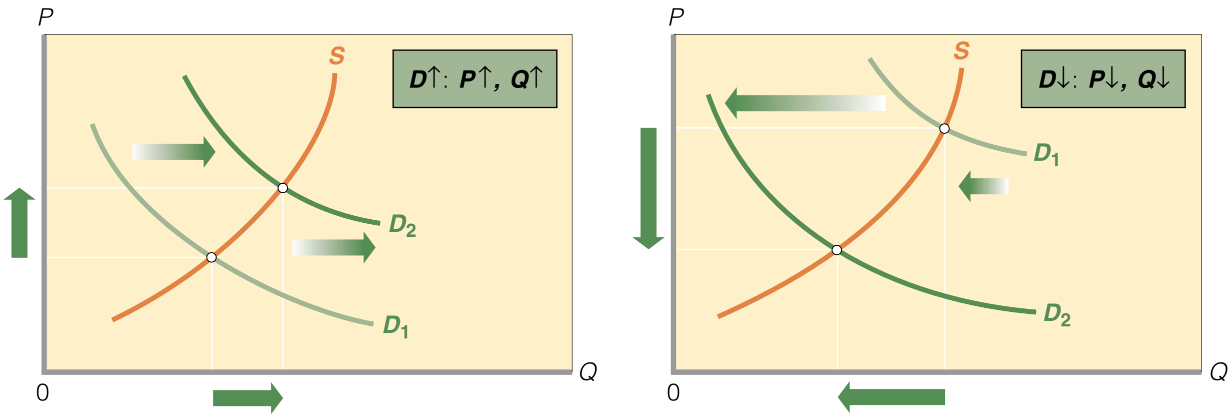
COMPLEX CASES

o s ly a a a , s a o a o o - al s.

1. **Supply Increase Demand Decrease** a ll a s ly r as a a a r as a o l r r o a s r as r , so r s l s a r ro r a r a a r s l ro r a alo . a a o l r a y r s o a s s ly a a ar o os r as s ly r as s l r a y, r as a r s . r o o a a y s o r la s s o a s s ly a a . r as s ly s lar r a r as a , l r a - y ll r as . r as a s r a r a r as s ly, l r a y ll r as .

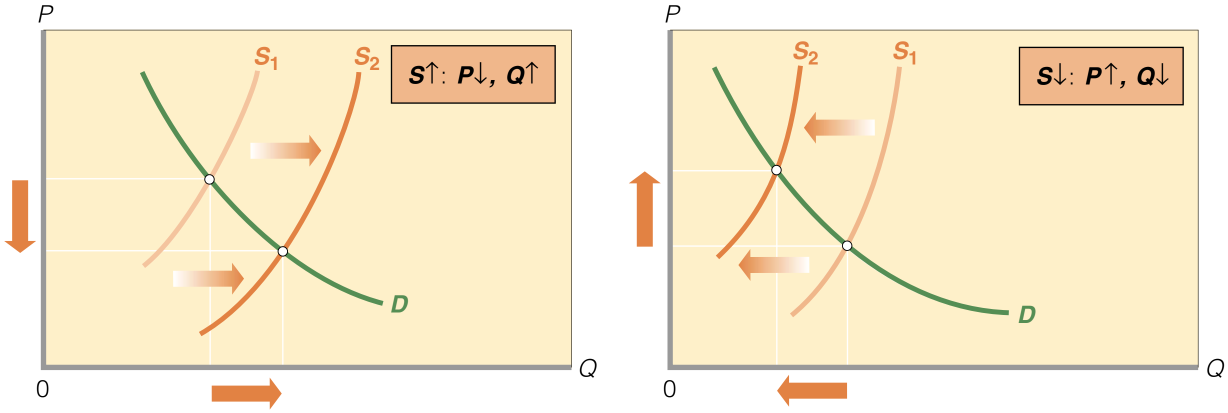
2. **Supply Decrease Demand Increase** r as s ly a a r as a o r as r . r o s a r as l r r r a r a a a s y r a s ara ly. r o l r a y s a a r a , o r la s s o a s s ly a a . r as s ly s lar r a r as a , l r a y ll r as . o ras , r as a s r a r a r as s ly, l r a - y ll r as .

FIGURE 3-6 CHANGES IN DEMAND AND SUPPLY AND THE EFFECTS ON PRICE AND QUANTITY



(a) Increase in demand

(b) Decrease in demand



(c) Increase in supply

(d) Decrease in supply

The increase in demand from D_1 to D_2 in (a) increases both equilibrium price and quantity. The decrease in demand from D_1 to D_2 in (b) decreases both equilibrium price and quantity. The increase in supply from S_1 to S_2 in (c) decreases equilibrium price and increases equilibrium quantity. The decline in supply from S_1 to S_2 in (d) increases equilibrium price and decreases equilibrium quantity. The boxes in the top right corners summarize the respective changes and outcomes. The upward arrows in those boxes signify increases in demand (*D*), supply (*S*), equilibrium price (*P*), and equilibrium quantity (*Q*); the downward arrows signify decreases in these items.

. **Supply Increase Demand Increase** a s ly a a o r as s ly r as ro s l r r , l a a r as oos s . r as s ly s r a r a r as a , l r r ll all. o os ol s, l r r ll r s . o l r a y s r a r as s s ly a a a ra s l r a y. r or , l r a y ll r as y a a o r a r a a a s y r a alo .

4. **Supply Decrease Demand Decrease** a a o r as s o s ly a a r as s ly s r a r a r as a ,

TABLE 3-9 EFFECTS OF CHANGES IN BOTH SUPPLY AND DEMAND

	Change in supply	Change in demand	Effect on equilibrium price	Effect on equilibrium quantity
1	Increase	Decrease	Decrease	Indeterminate
2	Decrease	Increase	Increase	Indeterminate
3	Increase	Increase	Indeterminate	Increase
4	Decrease	Decrease	Indeterminate	Decrease

l r r ll r s . r rs s
r , l r r ll all. a s
r as s s ly a a a
r l r a y, a s r
a l r a y ll all.

a l - s ar s s o r as s. o
rs a lly yo s o l ra s ly
a a a ra s or a as o o r
s l s a l - .
al as s ar s a r as -
a a a r as s ly, or a r as
a a a r as s ly, a ly
a l o . o as s, o -
l r r ll ro r ll o a .
(*Key Question 8*)

A Reminder: “Other Things Equal”

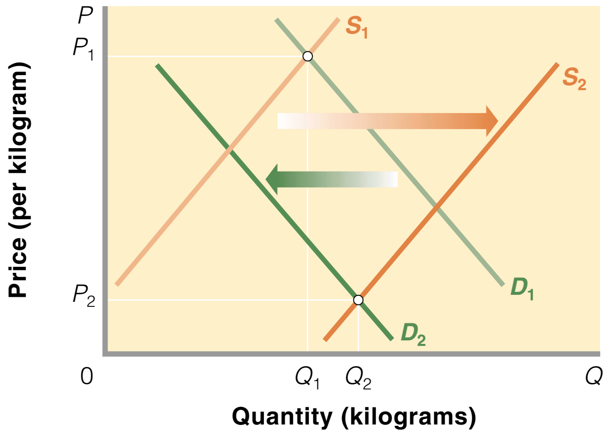
s s r ss o a a a s a a s ly r s (s as os
r -) s o r la o s s r s a a s a a s -
l , *o he hing e al*. o slo a r s ll s a r a a -
y a ar rs ly r la , o r s al. slo s ly r s
ly a r a a y s l ar r ly r la , o r s al.
yo or o r- s- al ass o , yo a o r s a o s
a *eem* o o s as r l s. or a l , s os salsa
a a r rs s ll o ll o o l s o salsa a \$ a o l o y ar, o ll o
o l s a \$ y ar a r ll o a \$ y ar r a r. r a
a y r as ary r ly, a s a a s o a o s la o
a . r s o o r s a a o o r la o a .
a s a la o a ’s o r- s- al ass o as o-
la o r r y ars a l . ally, a s o a as s
a r s o s, a or salsa as r as s ar ly, as r - a.
r s l s r r s *and* lar r a s r as .
o r a l r o o o as o ally as s o ar a sa
a a y o o ro as l . s s s ly o -
ra r r la o s r a a y o y s ly.
a a a s a o r- s- al ass o rly slo s -
ly r as ola . oor o ar s s r as s ly, as r - ,
r as l r r o o a r l r a y.
s a l s as or a o o r arl r s o a
a a y a (or s l) a a a a (s ly).
r - a a a a a s s a a a y s l . r
- a a s ly a s s a a a y a .

Application: Pink Salmon

o r or s as, l ’s r y a a r al- orl ar ar or
sal o . s ar as a s a ar ro , or r as s s a -
ally l r y ars.
a or o a o, s rs ar a r la ly r or a lo ra o
sal o ro o o . a r s r r s as P_1 r - a

FIGURE 3-7 THE MARKET FOR PINK SALMON

In the last two decades, the supply of pink salmon has increased and the demand for pink salmon has decreased. As a result, the price of pink salmon has declined, here from P_1 to P_2 a kilogram. Since supply has increased more than demand has declined, the equilibrium quantity of pink salmon has increased, here from Q_1 to Q_2.



rs o o s ly r S_1 a a r D_1. orr s o a y
o sal o y s a ly or a s r r s as Q_1 o s.
r as a s, s ly a a s ar or
sal o . s ly s , ro olo y or o lar r, or -
s oa s r a ly r as a a lo r os o o a .
lso, ro s a r P_1 o ra a y s rs o r s ry. s
a r s l o s a s, s ly o sal o r a ly r as a s -
ly r s o r , as ro S_1 o S_2 r - .

r sa y ars, a or sal o r as , as r r s y
l ar s ro D_1 o D_2 r - . a r as r s l ro r as s
o s r o a r o s r o s s ro s. s y rs'
o s r as , y s a a ay ro a s a o ar r-
al y r s or ro s , l r- al y s s o sal o s as
la , oo , a o o sal o . or o r, r o s ar ,
sal o ar ra s s, lo r r s o s s s s s.
a , oo, r a or sal o .

r as s ly o , a a or, sal o r a ly r r
o sal o , as r r s y ro ro P_1 o P_2 r - . o s -
ly r as a r as l r l r r . o r,
l r *an i* o sal o r as , as r r s y o ro Q_1
o Q_2. o s s o r r l r r , l r a -
y r as a s r as s ly r as a .

QUICK REVIEW

- In competitive markets, prices adjust to the equilibrium level at which quantity demanded equals quantity supplied.
- The equilibrium price and quantity are those indicated by the intersection of the supply and demand curves for any product or resource.
- An increase in demand increases equilibrium price and quantity; a decrease in demand decreases equilibrium price and quantity.
- An increase in supply reduces equilibrium price but increases equilibrium quantity; a decrease in supply increases equilibrium price but reduces equilibrium quantity.
- Over time, equilibrium price and quantity may change in directions that seem at odds with the laws of demand and supply because the other-things-equal assumption is violated.

The LAST word

TICKET SCALPING: A BUM RAP?

Some market transactions get a bad name that is not warranted.

KEY CONCEPTS **The Effectiveness of Markets**

Tickets to athletic and artistic events are sometimes resold at higher-than-original prices—a market transaction known by the term "scalping." For example, the original buyer may resell a $50 ticket to an NHL game for $200, $250, or more. The media often denounce scalpers for "ripping off" buyers by charging "exorbitant" prices. Scalping and extortion are synonymous in some people's minds.

But is scalping really sinful? We must first recognize that such ticket resales are voluntary transactions. Both buyer and seller expect to gain from the exchange. Otherwise it would not occur! The seller must value the $200 more than seeing the event, and the buyer must value seeing the event more than the $200. So there are no losers or victims here: Both buyer and seller benefit from the transaction. The "scalping" market simply redistributes assets (game or concert tickets) from those who value them less to those who value them more.

Does scalping impose losses or injury on other parties, in particular the event sponsors of the event? If the sponsors are injured, it is because they initially priced tickets below the equilibrium level. In so doing they suffer an economic loss in the form of less revenue and profit than they might have otherwise received. But the loss is self-inflicted because of their pricing error. That mistake is quite separate and distinct from the fact that some tickets were later sold at a higher price.

What about spectators? Does scalping deteriorate the enthusiasm of the audience? No! People who have the greatest interest in the event will pay the scalper's high prices. Ticket scalping also benefits the teams and performing artists, because they will appear before more dedicated audiences—ones that are more likely to buy souvenir items or CDs.

So, is ticket scalping undesirable? Not on economic grounds. Both seller and buyer of a "scalped" ticket benefit, and a more interested audience results. Event sponsors may sacrifice revenue and profits, but that stems from their own misjudgment of the equilibrium price.

CHAPTER SUMMARY

1. A market is an institution or arrangement that brings together buyers and sellers of a product, service, or resource for the purpose of exchange.

2. Demand is a schedule or curve representing the willingness of buyers in a specific period to purchase a particular product at each of various prices. The law of demand implies that consumers will buy more of a product at a low price than at a high price. Therefore, other things equal, the relationship between price and quantity demanded is negative or inverse and is graphed as a downsloping curve. Market demand curves are found by adding horizontally the demand curves of the many individual consumers in the market.

3. Changes in one or more of the determinants of demand (consumer tastes, the number of buyers in the market, the money incomes of consumers, the prices of related goods, and price expectations) shift the market demand curve. A shift to the right is an increase in demand; a shift to the left is a decrease in demand. A change in demand is different from a change in the quantity demanded, the latter being a movement from one point to another point on a fixed demand curve because of a change in the product's price.

4. Supply is a schedule or curve showing the amounts of a product that producers are willing to offer in the market at each possible price during a specific period. The law of supply states that, other things equal, producers will offer more of a product at a high price than at a low price. Thus, the relationship between price and quantity supplied is positive or direct, and supply is graphed as an upsloping curve. The market supply curve is the horizontal summation of the supply curves of the individual producers of the product.

5. Changes in one or more of the determinants of supply (resource prices, production techniques, taxes or subsidies, the prices of other goods, price expectations, or the number of sellers in the market) shift the supply curve of a product. A shift to the right is an increase in supply; a shift to the left is a decrease in supply. In contrast, a change in the price of the product being considered causes a change in the quantity supplied, which is shown as a movement from one point to another point on a fixed supply curve.

6. The equilibrium price and quantity are established at the intersection of the supply and demand curves. The interaction of market demand and market supply adjusts the price to the point at which the quantity demanded and supplied are equal. This is the equilibrium price. The corresponding quantity is the equilibrium quantity.

7. The ability of market forces to synchronize selling and buying decisions to eliminate potential surpluses and shortages is known as the rationing function of prices.

8. A change in either demand or supply changes the equilibrium price and quantity. Increases in demand raise both equilibrium price and equilibrium quantity; decreases in demand lower both equilibrium price and equilibrium quantity. Increases in supply lower equilibrium price and raise equilibrium quantity; decreases in supply raise equilibrium price and lower equilibrium quantity.

9. Simultaneous changes in demand and supply affect equilibrium price and quantity in various ways, depending on their direction and relative magnitudes.

TERMS AND CONCEPTS

change in demand, p. 57
change in quantity demanded, p. 57
change in quantity supplied, p. 61
change in supply, p. 61
complementary goods, p. 55
demand, p. 50
demand curve, p. 52
demand schedule, p. 50
determinants of demand, p. 53
determinants of supply, p. 58
equilibrium price, p. 63
equilibrium quantity, p. 63
income effect, p. 51
inferior good, p. 55
law of demand, p. 51
law of supply, p. 58
marginal utility, p. 51
market, p. 50
normal good, p. 55
rationing function of prices, p. 63
shortage, p. 62
substitute goods, p. 55
substitution effect, p. 51
supply, p. 57
supply curve, p. 58
supply schedule, p. 57
surplus, p. 62

STUDY QUESTIONS

1. Explain the law of demand. Why does a demand curve slope downward? What are the determinants of demand? What happens to the demand curve when each of these determinants changes? Distinguish between a change in demand and a change in the quantity demanded, noting the cause(s) of each.

2. KEY QUESTION What effect will each of the following have on the demand for product B?

- **a.** Product B becomes more fashionable.
- **b.** The price of substitute product C falls.
- **c.** Income declines and product B is an inferior good.
- **d.** Consumers anticipate the price of B will be lower in the near future.
- **e.** The price of complementary product D falls.
- **f.** Foreign tariff barriers on product B are eliminated.

3. Explain the following news dispatch from Hull, England: "The fish market here slumped today to what local commentators called 'a disastrous level'—all because of a shortage of potatoes. The potatoes are one of the main ingredients in a dish that figures on almost every café-menu—fish and chips."

4. Explain the law of supply. Why does the supply curve slope upward? What are the determinants of supply? What happens to the supply curve when each of these determinants changes? Distinguish between a change in supply and a change in the quantity supplied, nothing the cause(s) of each.

5. KEY QUESTION What effect will each of the following have on the supply of product B?

- **a.** A technological advance in the methods of producing product B.
- **b.** A decline in the number of firms in industry B.
- **c.** An increase in the prices of resources required in the production of B.
- **d.** The expectation that the equilibrium price of B will be lower in the future than it is currently.
- **e.** A decline in the price of product A, a good whose production requires substantially the same techniques and resources as does the production of B.
- **f.** The levying of a specific sales tax on B.
- **g.** The granting of a 50-cent per-unit subsidy for each unit of B produced.

6. "In the corn market, demand often exceeds supply and supply sometimes exceeds demand." "The price of corn rises and falls in response to changes in supply and demand." In which of these two statements are the terms *supply* and *demand* used correctly? Explain.

7. KEY QUESTION Suppose the total demand for wheat and the total supply of wheat per month in the Winnipeg grain market are as follows:

Thousands of bushels demanded	Price per bushel	Thousands of bushels supplied	Surplus (+) or shortage (–)
85	$3.40	72	________
80	$3.70	73	________
75	$4.00	75	________
70	$4.30	77	________
65	$4.60	79	________
60	$4.90	81	________

- **a.** What is the equilibrium price? What is the equilibrium quantity? Fill in the surplus–shortage column and use it to explain why your answers are correct.
- **b.** Graph the demand for wheat and the supply of wheat. Be sure to label the axes of your graph correctly. Label equilibrium price *P* and equilibrium quantity *Q*.
- **c.** Why will $3.40 not be the equilibrium price in this market? Why not $4.90? "Surpluses drive prices up; shortages drive them down." Do you agree?
- **d.** Now suppose that the government establishes a ceiling (legal maximum) price of, say, $3.70 for wheat. Explain carefully the effects of this ceiling price. Demonstrate your answer graphically. What might prompt government to establish a ceiling price?

8. **KEY QUESTION** How will each of the following changes in demand and/or supply affect equilibrium price and equilibrium quantity in a competitive market; that is, do price and quantity rise, fall, or remain unchanged, or are the answers indeterminate because they depend on the magnitudes of the shifts? Use supply and demand diagrams to verify your answers.
    - **a.** Supply decreases and demand is constant.
    - **b.** Demand decreases and supply is constant.
    - **c.** Supply increases and demand is constant.
    - **d.** Demand increases and supply increases.
    - **e.** Demand increases and supply is constant.
    - **f.** Supply increases and demand decreases.
    - **g.** Demand increases and supply decreases.
    - **h.** Demand decreases and supply decreases.
9. "Prices are the automatic regulator that tends to keep production and consumption in line with each other." Explain.
10. Explain: "Even though parking meters may yield little or no revenue, they should nevertheless be retained because of the rationing function they perform."
11. Critically evaluate: "In comparing the two equilibrium positions in Figure 3-6a, I note that a larger amount is actually purchased at a higher price. This refutes the law of demand."
12. Suppose you go to a recycling centre and are paid $.25 per kilogram for your aluminum cans. However, the recycling firm charges you $.20 per bundle to accept your old newspapers. Use demand and supply diagrams to portray both markets. Explain how different government policies with respect to the recycling of aluminum and paper might account for these different market outcomes.
13. **Advanced analysis:** Assume that demand for a commodity is represented by the equation $P = 10 - .2Q_d$ and supply by the equation $P = 2 + .2Q_s$, where Q_d and Q_s are quantity demanded and quantity supplied, respectively, and P is price. Using the equilibrium condition $Q_s = Q_d$, solve the equations to determine equilibrium price. Now determine equilibrium quantity. Graph the two equations to substantiate your answers.
14. **(Last Word)** Discuss the economic aspects of ticket scalping, specifying gainers and losers.

INTERNET APPLICATION QUESTION

1. **Changes in Demand—Baby Diapers and Retirement Villages** Other things equal, an increase in the number of buyers for a product or service will increase demand. Baby diapers and retirement villages are two products designed for different population groups. The U.S. Census www.census.gov/ipc/www/idbpyr.html provides population pyramids (graphs that show the distribution of population by age and sex) for countries for the current year, 2025, and 2050. View the population pyramids for Mexico, Japan, and Canada. Which country would you expect to have the greatest percentage increase in demand for baby diapers in the year 2050? For retirement villages? Which country would you expect to have the greatest absolute increase in demand for baby diapers? For retirement villages?

o

a r

THE MATHEMATICS OF MARKET EQUILIBRIUM

ar l r s r a a y, o as a r (Q^*, P^*), o a o o y o or sol a r P^*. ollo a a al o ro s a ro o o o a ar l r (Q^*, P^*) s r .

ar l r s o y s ar a (y rs' a o r), ar s ly (s ll rs' a o r), a o a ro ss (o a r o r a a y, a ly P^* a Q^*, o o ra sa). ar - l r s y o o r a a o o a ro ss a a r y o a , P^*, a y o o o y a y rs ar ll- o y, o as Q_D, a a y s ll rs ar ll o s ll, o as Q_S, a s a ly.

a o s r o ar slo a , Q_D r r s s a y a y y rs a P r , s

$$P \quad a \quad bQ_d$$

a lls s a r s r a a y rs ll o y s, or a ra sa o o o r r s lo r. a also lls s a a a r lo r a a a y a y y rs r as s. y rs' a o r, as s r y a a o , s a a lo r r s y rs y or a y.

a o s r ar slo ar s ly o , Q_S r r s s a y s l y s ll rs a P r s

$$P \quad c + dQ$$

or s ll rs r s lo r a c y ll s ll o . r s c or r, s ly a o s a s a s ll rs a r r s s ll or a y. ll rs' a o r, as s r y s ly a o , s a a r r s s ll rs s ll or a y.

o a ro ss (r a a y or o a s) ro s a s y , ally, y rs a s ll rs a r o a r , P^*, a a a y, Q^*, a y a y a s ll a s o l ra sa o . o o a ro ss, a y a y y rs, Q_D, s al o a y s l y s ll rs, Q_S (a a r - o r), a s ar- s l r . a a al r r s a o o s a o a ro ss s s r ollo ara ra s.

a r r , P^*, l r o o o o a ro ss, al y a y a a s l , s

$$D_d \quad Q_S$$

a o Q^* as l r a y, s a Q^* Q_d Q . o sol or l r a y Q^* a l r r P^* a a s ly o s ar s . Q^* l r a y, or y rs

$P^* \quad a \quad bQ^*,$

a or s ll rs

$P^* \quad c + dQ^*.$

o , s P^* s sa a r - o r y o y r a s ll r,

$a \quad bQ^* \quad c + dQ^*,$

l r a y, Q^*, as

$Q^* \quad (a \quad c)/(b + d).$

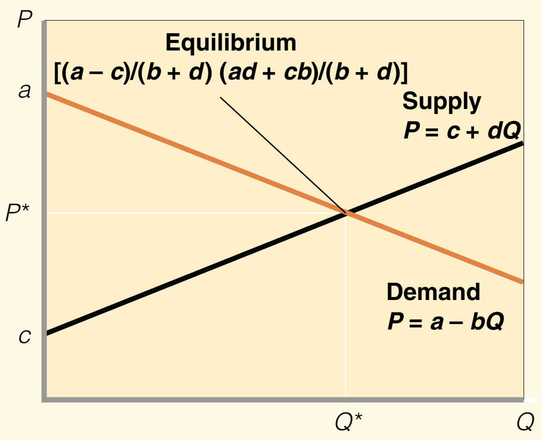
o P^* s s $(a \quad c)/(b + d)$ s ly (or a) o .

$P^* \quad c + d(a \quad c)/(b + d),$ s

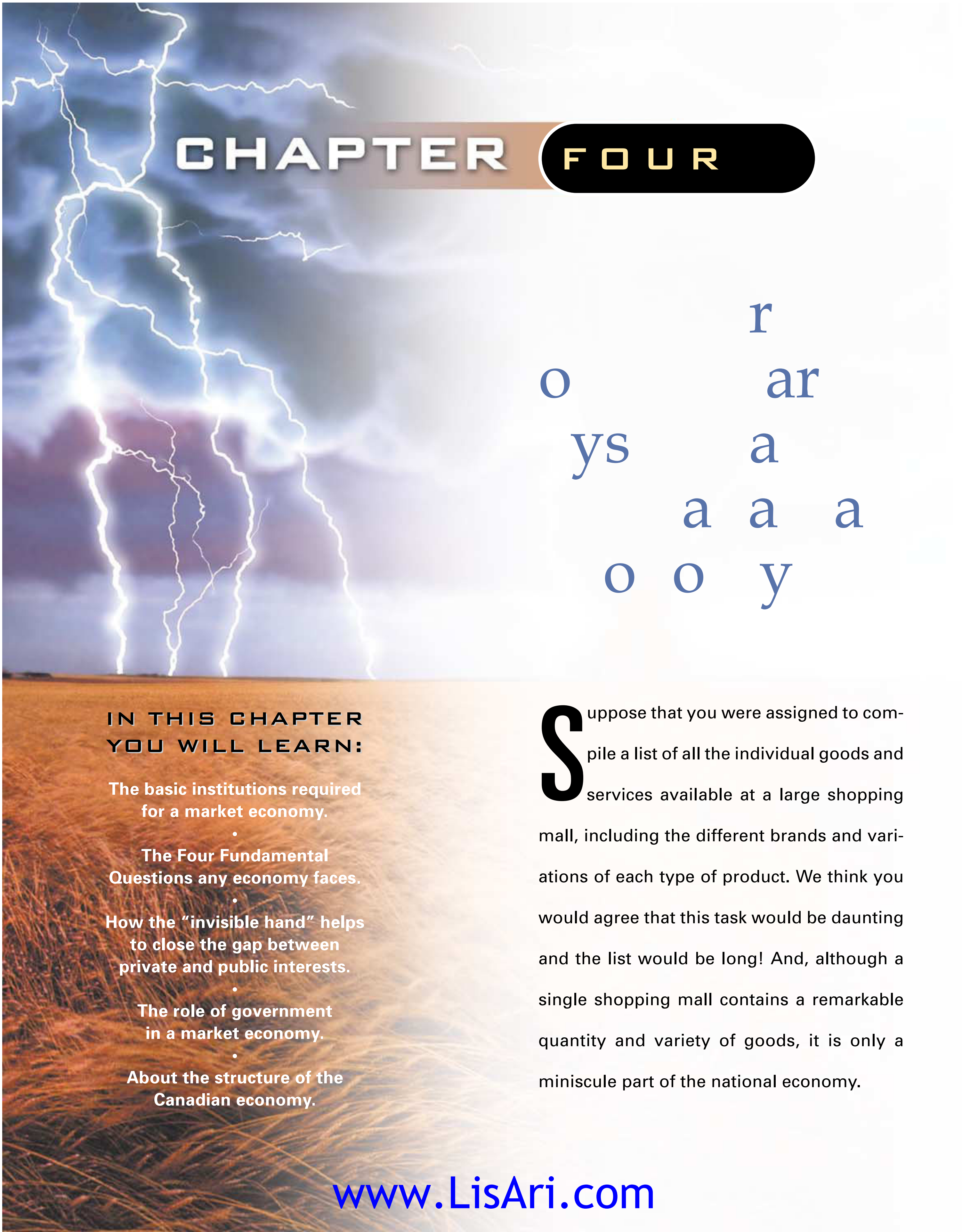
$P^* \quad (ad + bc)/(a + d).$

l r s (Q^*, P^*) $(a \quad c)/(b + d), (ad + cb)/(a + d)$. ar l r ay also r r s a ra a ally, as s o r -1.

FIGURE A3-1



- Increase (decrease) in demand, *a* increases (decreases) and both *Q** and *P** increase (decrease)
- Increase (decrease) in supply, *c* decreases (increases) and *Q** increases (decreases) and *P** decreases (increases)



CHAPTER FOUR

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o o y

IN THIS CHAPTER YOU WILL LEARN:

- The basic institutions required for a market economy.
- The Four Fundamental Questions any economy faces.
- How the "invisible hand" helps to close the gap between private and public interests.
- The role of government in a market economy.
- About the structure of the Canadian economy.

Suppose that you were assigned to compile a list of all the individual goods and services available at a large shopping mall, including the different brands and variations of each type of product. We think you would agree that this task would be daunting and the list would be long! And, although a single shopping mall contains a remarkable quantity and variety of goods, it is only a miniscule part of the national economy.

o a ar lar oo s a s r s a a la l a all a roa r o o y s o l ro o ro rs r olo y a y s o r so r s o s ro s ar lar oo s o ll o a s ro s a a o s or a ro ro s a o s oo s

a r sa o l r r s a a s ar s a l s *indi id al* ro a r so r ar s. o o r o s o a *all* ro ar s a r so r ar s *ca i ali m,* also all *he i a e en e i e em* or s ly *ma ke em.* s a r a ara r s s o ar sys a o a s rs s o s s as os os a o .

CHARACTERISTICS OF THE MARKET SYSTEM

The Effectiveness of Markets

ar r s o r y rs a s ll rs. a a lo al ar r la- ly o l ar a , or a o a r a o al s al r y rs a s ll rs ro all o r lo ar a . or r or ar sys o - o s ral o a l ara r s s s r s r a ro r y, r o o r r s a o , s l - r s as o a o , o o , a a l - rol or o r .

Private Property

PRIVATE PROPERTY The right of private persons and firms to obtain, own, control, employ, dispose of, and bequeath land, capital, and other property.

a ar sys , r a als a r s, o o r , o os o ro r y r so r s (la a a al). a , s s s r a o - rs o a al a s a al s s a . s r o **private property,** o - l r o o o a l al o ra s, a l s als a s ss s oo a , s , a s os o ro r y r so r s as y s . r o ro r y o rs o s a o ll r r ro r y y s s- a s s o o r a ro r y.

ro r y r s o ra s , o a o , a , a a o ro r y, a a s o o ro o o oo s a s r s. l os ry- o a s a als s o s or s, l a or s, or l ar la or ar a s y a r a r ar s. y o l y o so o r , or a yo ls , o l a a ro r y ro

ro r y r s also o ll al ro r y ro a s, o y- r s, a ra ar s. lo - r ro o o ra s o l o r oo s, s , a o r ro ra s a o ro s a ro o ro ss s o ar a o rs ll s al a r ar s y ay r .

ro r y r s also a l a a . l o a a o o l or o a a l ra ass r s y r a s ll r s l a o r. or o r, ro r y r s o ra o rs o a a or ro r ro r y so as o r s r or r as s al . ally, ro r y r s a l o l o s r a r so r s o ro or oo s a s r s, ra r a s o ro- a r a ro r y y a alr a y ro or a r .

Freedom of Enterprise and Choice

los ly r la o r a o rs o ro r y s r o o r r s a o . ar sys r r s a ar o s o o s a o s, ar r ss a l o o y's ar s.

- **reedom of enterprise** s r s a r r rs a r a s ss s ar r oo a a s r so r s o ro r o o oo s a s r s, a o s ll ar s o r o .
- **reedom of choice** allo s o rs o loy or s os o r ro r y a o y as y s . also allo s or rs o r a y l o or or y ar al . ally, s r s a o s rs ar r o y oo s a s r s a s sa s y r a s.

s o s ar r o ly roa l al l a o s, o o rs . ll al o s s as s ll a or a s or y ll r s ar s ro s a r so . (Glo al rs .1 r als a r o o o r o ar s r a ly ro a o o a o .)

FREEDOM OF ENTERPRISE The freedom of firms to obtain economic resources, to use these resources to produce products of the firm's own choosing, and to sell their products in markets of their choice.

FREEDOM OF CHOICE The freedom of owners of property resources to employ or dispose of them as they see fit, of workers to enter any line of work for which they are qualified, and of consumers to spend their incomes in a manner that they think is appropriate.

Self-Interest

ar sys , **self-interest** s o a or o all ar o s o-o s as y r ss r r o s. l- r s a s a a o-o r s o o a s s or s l . r r rs ry o a ro or loss. ro r y o rs ry o s r or sal or r o r r so r s. or rs ry o a r l y (sa s a o) y o s a o r s o a o o a s, o rs, r s, a or o-o s. o s rs ry oo a ro s y a a lo s oss l r a a or o r r s o a r l y.

SELF-INTEREST That which each firm, property owner, worker, and consumer believes is best for itself and seeks to obtain.

GLOBAL PERSPECTIVE 4.1

Index of Economic Freedom, Selected Nations

The Index of Economic Freedom measures economic freedom using 10 broad categories, such as trade policy, property rights, and government intervention, with each category containing more than 50 specific criteria. The Index then ranks 157 nations according to the degree of economic freedom. A few selected rankings for 2000 are listed here.

FREE
1 Hong Kong
4 New Zealand
5 United States

MOSTLY FREE
13 Chile
14 Canada
20 Germany

MOSTLY UNFREE
75 Malaysia
93 Brazil
106 Poland

REPRESSED
144 Vietnam
151 Iran
152 Cuba

Source: Heritage Foundation and the *Wall Street Journal.*

rs o s l- r s s o sa as s l s ss. l- r s s ly a s a so , a a l l o rs. s o ol r ay s o r s a a la l or ora s a o a a or o o o ay or o ra l r . or r ay a as- o o o l ay oll or rs y o or r or s l r . r- r r ay a a or a o a o o a ar a l o a o . or a l , r r, r r r o s ar , o a o ll o . . ollars o a o s!

Competition

COMPETITION The presence in a market of a large number of independent buyers and sellers competing with one another and the freedom of buyers and sellers to enter and leave the market.

ar sys os rs **competition** a o o o s. as s o s o o s r o o o r s rs o s r r . ry roa ly , *com e i ion* r r s

- ly a s ll rs a y rs o ra a ar lar ro or r so r ar
- r o o s ll rs a y rs o r or l a ar s, as o r s l- r s

o o s s o o o r s ss s a o s ol s a a o o y. r ar ly a s ll rs a y rs a ar , o o y r or s ll r s a l o a r o ro . o s r s ly s o ro ar . a ro o ss ar , s r r s s. s aso a l ros lor a ay s r o sly r s ly o r s ro s a s ar ly r as r o ora s. larly, a s l ro r a so o r s r o al o o a ro , a ra s ro 's r . y o roll ar s ly, a r a r ar o s o a a a . a s o oss l ar s s l rs o . r a ras s s r ll los ar or all o s s ss o o ors.

sa r aso a l s o a s o ar . a s r ar l l y rs, s l y rs a o a la ar o r o a a- a y r s o ay ar r .

o o also l s a ro rs a r or l a a s ry r ar o s r o a l arr rs o a s ry a or o ra . s r o o a s ry o a or o ra ro s o o y l y o r a o r . r o o ry a a l s o- o y o a s o a s o s r as s, olo y, a r so r a a la l y. *The diff ion of economic o e inhe en in com e i ion limi he o en ial ab e of ha o e .* ro r o ar s or a o ar r ll los sal s o o r ro rs. loy r o ays l ss a o ar a ll los or rs o o r loy rs. r a a ls o lo ol- o y ll los ro s o r s a o. o o s as r la ory or ar sys .

Markets and Prices

ar s a r s ar y ara r s s o ar sys . y sys- s a l y o oor a ll o s o a ly o o s o s. o ro a rs 2 a a a ar s a a s a r s y rs (a rs) a s ll rs (s l rs) o o a . ar sys s ssary o o y s o s a y y rs a s ll rs o ro s a r so r s. s o s a o a s o ar r a s o ro a r so r r s a r so r o rs, r r rs, a o s rs as y a a r s r r o s a rs r s l - r s .

ar sys s l s a or a a s . s r s as a la ora o a o or ro ra l al r o s ar r or , s ar , a ala . os o r s o o ar s als a o y ar a s ar r ar r a r ro a o os o o o r s o o s s als a oos o or ar a s ar al . ro s a s so y s a o o y s o l ro , o ro o a or a ly, a o r so ro o ar o s r a o ar o s s a a o o y.

Active but Limited Government

al ara r s o ar sys , as o r o o s, s a a l o r . l o a ar sys ro o s a r o y s o s r so r s, as r a s or o s. ll s o r la r s a r a o r a r as o rall ss o o o sys s ral ays.

QUICK REVIEW

- The market system requires private ownership of property, freedom of enterprise, freedom of choice, and limited government.
- The market system permits economic entities—business, resource suppliers, and consumers—to pursue and further their self-interest. It prevents any single economic entity from dictating the prices of products or resources.
- The coordinating mechanism of the market system is a system of markets and prices.

Technology and Capital Goods

ar sys os rs s s o a al oo s. ar sys , o o , r o o o , s l - r s , a rso al r ar ro o or y a o a o or olo al a a . o ary r ar s or ro s or ro o s a r r ly o o a or. ar- sys r or o ra s s s a ra lo o o l a al oo s ools, a ry, lar -s al a or s, a a l s ors ora , o - a o , ra s or a o , a ar .

a olo y a a al oo s ar or a a s os r o s o ro o ar l as . o ly ay o a o a y s o r ly o **roundabout production**. o l r lo s or a ar r o o a ro o ar a s. r ar s or o or ro o a , r or , a or a a o o r ro r a a s s ools o ro o (a al) as lo s, ra ors, s ora s, a so o .

ROUNDABOUT PRODUCTION The construction and use of capital to aid in the production of consumer goods.

SPECIALIZATION The use of the resources of an individual, a firm, a region, or a nation to produce one or a few goods and services.

Specialization

o ar o o s r ly o **specialization** s raor ary. a or y o o s rs ro r ally o o oo s a s r s y o s , a y o s l l or o o a y ro . or r o o s o rs a ay o s all o s or s ay o a o a. a y ar rs s ll r l o lo al a ry a y ar ar a lo al ro ry s or . o y l ar lo a o a s l -s y r s y. a -o -all- ra s ay a ry olo r l al s r a ly o a ro r.

DIVISION OF LABOUR

DIVISION OF LABOUR Dividing the work required to produce a product into a number of different tasks that are performed by different workers.

a s al a o all **division of labour** o r s o a so y's o s ral ays.

- ***Specialization makes use of differences in ability.*** al a o a l s als o a a a a o s r s r a l s a s lls. a a s s ro a s , a oo a ra a als, a a a s a a slo a , r s r o o al s a os ly s s a s s.
- ***Specialization fosters learning by doing.*** a l s o a ar al, s al a o ay s ll a a a o s. y o all yo r o a s l as , yo ar or l ly o lo s lls r r s a o s ro s a yo o l y or a a r o - r as s. o l ar o a oo r y o ry ay.
- ***Specialization saves time.*** y o all yo r o a s l as yo a o loss o rr s ro o o o a o r.

or all s r aso s, s al a o r as s o al o so y r s ro l r so r s.

GEOGRAPHIC SPECIALIZATION

al a o also or so a r o al a r a o al as s. s o a l a a l s o l ro as a a , a s o s a l yo la , ra all, a ra r , os s o l ry . s o a l a a o l ro r s ol a. or s lar r aso s s ro o o l os ly. o, as a a ar rs ro ro s a ar - lar or r r so r s ar s s , a r s ol a s (a a a all y) o sa , ro a l s a o r r s. y s al , o o o s ro or a s lo ally. , ry s s ly, y s a so o r s r l s s a or a l s, a l s or a .

larly, o a r a o al s al , a a a s al s ro s s as l o a o a s all o r al a r ra , s lls a roa a or o r or rs ro a a , a a as ro o ras, a o as s ro a la . o a s al a o a o ra al s - al a o ar o a y s o l r so r s.

Use of Money

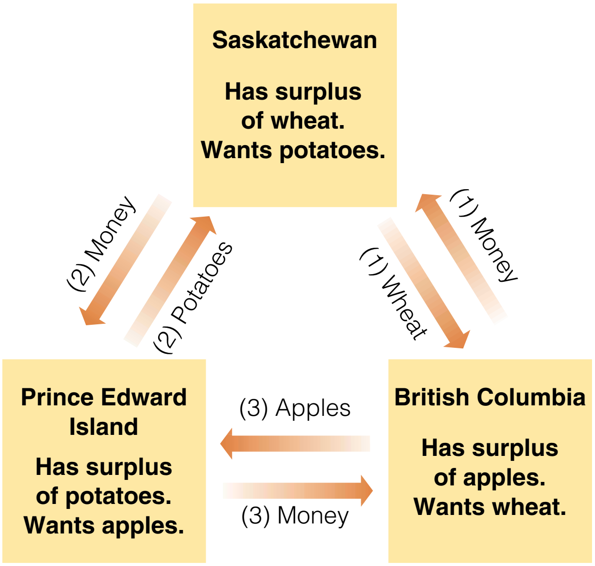
MEDIUM OF EXCHANGE Items sellers generally accept and buyers generally use to pay for a good or service.

BARTER The exchange of one good or service for another good or service.

al a o a ra r r s s o o y. o y r or s s ral o s, rs a or os s a **medium of exchange**. a s ra as r. *A con enien mean of e changing good i e i ed fo eciali a ion.* a a , a so s o s, o r ro **barter** s a oo s or oo s, say, a or a l s. ar r os s s r o s ro l s or o o y a s r r s a

FIGURE 4-1 MONEY FACILITATES TRADE WHEN WANTS DO NOT COINCIDE

The use of money as a medium of exchange permits trade to be accomplished despite a non-coincidence of wants. (1) Saskatchewan trades the wheat that B.C. wants for money; (2) Saskatchewan trades the money it receives from B.C. for the potatoes it wants from P.E.I.; (3) P.E.I. trades the money it receives from Saskatchewan for the apples it wants from B.C.


Saskatchewan
Has surplus of wheat. Wants potatoes.
(2) Money
(2) Potatoes
(1) Money
(1) Wheat
Prince Edward Island
Has surplus of potatoes. Wants apples.
(3) Apples
(3) Money
British Columbia
Has surplus of apples. Wants wheat.

www.swp.com
Saskatchewan Wheat Pool

MONEY Any item that is generally acceptable to sellers in exchange for goods and services.

coincidence of an y ra s ll r. o r a l , ass a as a a a ss a o ra a a a l s. ass a r s ol a a ss a l s o ra a a a . o a a o rr . s a o o a s s ss , ra a o o r.

os as a a as o r s r s ol a's a l s a s o a o s ro r ar sla . s os a r ar sla a s r s ol a's a l s o as a a 's a . , o o l a a- rs, s os a r s ol a a s so o as a a 's a o o 's o a o s. s ar s a o r -1.

o o s as s s o r s r a o o a s, s ra y ar r l arly o l l . s a , o l a ro s **money**, s s ly a o so al o o a l a a s o oo s a s r s. s or ally, o l a s a l , ar s, s lls, s o s, s o al, a a y o r o o s, ary r s o s ss, as a o a . o s r as o y, a s o ass o ly o s *I m be gene all acce able o elle in e change fo hei good and e ice* . o y s so ally a r so y a s as a o a *i* o y.

os o o s s s o a r as o y. s o a r ollars (r- r y) as a o a s a a l s as a a , . ., a . . . o o r o r ra s al a , as o s ra r -1.

a lo al as s a a r a o s a r rr s o l- a s s al a o a a . o r, ar s rr s ar o a sol a oss l or r s s o a a a, a a , G r a y, r a , a o, ro s a o ollars, y , ros, o s, a sos, o or a o r, o a oo s a s r s.

QUICK REVIEW

- The market systems of modern industrial economies facilitate the extensive use of technologically advanced capital goods. Such goods help these economies achieve greater efficiency in production.
- Specialization is extensive in market systems; it enhances efficiency and output by enabling individuals, regions, and nations to produce those goods and services for which their resources are best suited.
- The use of money in market systems facilitates the exchange of goods and services that specialization requires.

THE MARKET SYSTEM AT WORK

HOUSEHOLD An economic unit (of one or more persons) that provides the economy with resources and uses the income received to purchase goods and services that satisfy material wants.

FIRM An organization that employs resources to produce a good or service for profit.

r ar o r ary *deci ion make* a ar o o y **households** (o - s rs) a **firms** (s ss s). o s ol s ar l a s l rs o o o r so r s a s l a o sly a or s ro o o y. r s ro- oo s a s r s o o o y.

a o a a ar sys s ara r y o o , r o o r r s , a o . o s rs ar r o y a y oos r r rs a r s ar r o ro a s ll a y oos a r so r s l rs ar r o a r ro r y a a r so r s a a la l a r s or o - a o y oos . ay o r y s a o o y o s o olla s aos. o s rs a r a as r al s ss s oos o ro a ro - s o s a r so r s l rs o a a r o r so ar , ro o o l s o a lo y a ar o s s y o s r o s. r al y, ll o s o s o s a y o s ol s a s ss s ar ly o s s o a o r. r s *do* ro oo s a s r s a o s rs a , a o s ol s *do* ro s o la o r a s ss s a .

FOUR FUNDAMENTAL QUESTIONS The four questions that every economy must answer.

o rs a o ra o o ar sys , yo s rs r o a ry o o y s r s o o **our undamental uestions:**

- a oo s a s r s ll ro
- o ll oo s a s r s ro
- o ll oo s a s r s
- o ll sys a o o a a

o r a al s o s l o o o s rly ro o oss l s r s ss a r 2. ’s a o ar sys a s rs a o s s o s a s a r ss s o o ro l .

What Will Be Produced?

ro a r so r r s la , s a l s ro o o o ro a r so r ar s, o ll ar sys o s - y s a a s o oo s o ro *Beca e b ine e eek o and a oid lo e , ho e good and e ice od ced a a con in ing o ll be od ced and ho e od ced a a con in ing lo ill no .* ro s a loss s o r o al r a r r s ro s ll s ro a o al os o ro ro . o s rs r s r r r r s o a s o ro ar ro rs a r so r s l rs r s o a ro r a ly s o r r r o s l - r s s. ar sys o a s a s o o s rs o s ss s a r so r s l rs a l s a ro r a r s o s s.

CONSUMER SOVEREIGNTY AND "DOLLAR VOTES"

CONSUMER SOVEREIGNTY Determination by consumers of the types and quantities of goods and services that will be produced with the scarce resources of the economy.

DOLLAR VOTES The "votes" that consumers and entrepreneurs cast for the production of consumer and capital goods, respectively, when they purchase them in product and resource markets.

ar sys , o s rs ar so r (o a). **Consumer sovereignty** or s ro o s r a , a o s r a s r al r- y s a a s o oo s ro . o s rs s o y ar ro sal o r r so r s o os oo s y ar os ll a a l o y. ro s **dollar votes** o s rs r s r r a s a a s o ro ar . ollar o s or a r a ro ar r a o o ro a or al ro , s ss s ll ro a ro . r s a r as o s r a , so a o ollar o s ar as o ro a o o ro , s ry ll a , as ll o o ro . o rs ly, a r as o s r a a r ollar o s as or ro ll r s l loss s, a , , s ry ll o ra . s r s l a s ry, o o ro ll l . , s- ry ay as o s . a , o s rs ar so r y oll ly r r so r s a ay ro s r s a ar o o s r a s. ollar o s o o s rs r o o ly s r s ll o o s also ro s ll s r or a l. a l 1 1, r s o o o ors a r o s s, o al 's ro s lo - a a r r. Goo a o r ally. os o s rs o ro oo ry a o as y, so sal s r a r . 1 o al 's ly ro a r r ro s a sa a ro s r- a r l r r. , o s rs a oll ly o o a r r.

MARKET RESTRAINTS ON FREEDOM

r s ar o r ally r o ro a r y s . o s rs' y - s o s a ro o o so ro s ro a l a ro o o o r ro s ro a l , s r s r o o r s a o ro- . r s s a r ro o o s o s r o s or ls a loss s a al a r y.

DERIVED DEMAND The demand for a resource that depends on the demand for the products it can be used to produce.

sa ol s r or r so r s l rs. a or r so r s s a **derived demand** r , a s, ro a or oo s a s r s a r so r s l ro . r s a a or a o or rs a s r s a a or a o o l s. r s o a or y- ra rs a s r s o a or y s. so r s l rs ar o r o allo a r r so r s o ro o o oo s a o s rs o o al ly. o- s rs r s r r r r s o a s o ro ar , ro- rs a r so r s l rs, ro y r o s l - r s , r s o a ro r a ly.

How Will the Goods and Services Be Produced?

ar sys s rs r so r s o os s r s a a ro s o- s rs a s ly a s os s r s s r , ar ro a l , a ay or r so r s. a s ry, r s a s r ar o s a ar ro- a l . a s o o s o - os ro rs, o ro a l- y r r s a r s ro r o a os . l as - os ro o ss a s, a o o r s, a r s lo a r ro o a l s o ally, a o o s ra o s a ors as r so r r s, r so r ro y, a ra s or a o os s.

as - os ro o also a s a r s s loy os o o ally o ro o ro r o . os ro- o s o

- a a la l olo y
- r s o r so r s

a r r s s a s o r so r s o ro a s a o ay ly *in* o o ally *if* os r so r s ar al ry ly ar . *Economic ef cienc mean ob aining a a ic la o of od c i h he lea in of ca ce e o ce , hen bo h o and e o ce in a e mea ed in dol- la and cen* .

Who Will Get the Goods and Services?

ar sys rs r o ays sol ro l o s- r o al o . G rally, a y ro ll s r o o s rs as o r a l y a ll ss o ay s s ar r . r o so ro , say, a o al la or, s $1 , os y rs o ar a l a ll o ay a r ll a o al la or. s s ra o o o l r r s.

a l y o ay l r r s or o al la ors a o r ro - s s o a o o o a o s rs ar . y ar s o a a o s r o y o a ar lar oo , y a a . a o o o y ar s o (1) a s o ro r y a a r so r s y s ly a (2) r s os r so r s o a r so r ar . s r s o a or s ro os r so r s. so r r s (a s, r s , r , ro) ar y r- s o a o s ol ’s o a r or a o s ol ’s a l y o y ar o o o y’s o .

How Will the System Accommodate Change?

ar sys s ar y a o s r r r s, olo y, a s l s o r so r s o s a ly a . ar lar allo a o o r so r s a s o os or a *eci c* a r o o s r as s, ra o olo al al r- a s, a s l s o r so r s ay o o sol a as o s r r r s a , s o ro o ar s o r , a r so r s - l s a o r . a ar o o y a s o s a s a s ll s r so r s ly

GUIDING FUNCTION OF PRICES

os o s r as s a . or s a , ass a o s rs y a or r a l ss l a o o y rr ly ro s. os a s o s r as s ll o a o ro rs ro a r as a or r a a l a or l . r r s llrs a l r s ll all.

o , ass a r s o s r s r oy ro s or s a s o s r a s , r r r s ll a r ro or r s ry, a lo r l r s ll a loss s or l s-ry. l - r s ll o ors o r ros ro s r s ry a ll or r s o l a r ss l s ry.

r ro a ally ollo s r as a or r ll o o ly a s ry o a ll also r o o a r so r s ss al o s ro . r r r s ll r r ro rs o ay r r s or r so r s, r y r as r so r a a ra r so r s ro l ss r al r a loy . r rs o rs l s ry, r r so r s a l s a r or rs a o r r so r s ar loy . s a s s o o y ar a ro r a r s o s s o a s o s r as s. s s o s r so r-y a or .

ar sys s a a o a o s sys . ro a s r s o a s a s s as a rs as o s r as s a l s a ro r a r s o s s ro s ss s a r so r s l rs. y a ro r s a ro s, a s o s r as s r a s o o so s-r s a o ra o o o rs. os a s s ar o y o r so r ar as a s r s a or r so r s a o ra s r s a r r s l a s r so r r s r so r s ro o ra s r s o a s r s.

GUIDING FUNCTION OF PRICES The ability of price changes to bring about changes in the quantities of products and resources demanded and supplied.

s *di ec ing* or **guiding function of prices** s a or l o ar sys- . o s a sys , so a s ra a y, s as a o r la oar , o l a o r s ss a r so r s o a ro r a s r s. s lar a alys s s o s a sys a a o s a s o o r a al a s or a l , o a s olo y a a a la l-y o ar o s r so r s.

ROLE IN PROMOTING PROGRESS

s o a s so a s ra l a s s a o r. o o s ar sys ro o olo al ro s a a al a la-o o a s a l a o r a r ro y a a r l l o a r al ll- or so y

Technological Advance ar sys ro s a s ro or o-lo al a a a a l s r ro s a ro ss s o r s as r or o s. r r r or r a ro s a o lar ro ll a ro . -olo al a a also l s a ro o s a r ro o or s r o os s. y ass ar o s os r o o o o s r ro a lo r ro r , r a r as sal s a o a o o ro a s o r al r s. or o r, ar sys s o o *a id ead* o olo al a a ro o a s ry. al r s s ollo l a o os o a r or ls s r a loss s a al a l r . so as s, r s l s **creative destruction:** r a o o ro s a ro o o s o l ly s roys ar os o s o r s a ar o s-ro s a ol r ays o o s ss. a l a o rso al o -rs a or ro ss so ar ol s ar or l r y r rs.

CREATIVE DESTRUCTION The hypothesis that the creation of new products and production methods simultaneously destroys the market power of existing monopolies.

Capital Accumulation os olo al a a s r r a o al a al oo s. ar sys ro s r so r s ssary o ro os oo s y a s ro ar a r so r ar ro r as ollar o s or a al oo s.

o ll r s r o s or a al oo s r r rs a o rs o s- ss s o s ar o r ro o o r as a al oo s. o so y l s r a r ro o r olo al o a o ss - ss l. lso, y ay r s or s ll o rs s ar s, r r r a r a a ra so o o o o s ol s o as ollar o s or ro- o o or a al oo s. (*Key Question 8*)

COMPETITION AND THE "INVISIBLE HAND"

s 1 oo *The Weal h of Na ion* , a rs o a o ra o o a ar sys r a s a r o s y r a r s s a so al r- s s. r s a r so r s l rs, s o r r r o s l- r s a o ra ra or o a ly o ar sys , ll s l- a o sly, as o y a **invisible hand,** ro o l or so al r s . a o ro , s ss s s l as - os ly o a o o r so r s o ro a s o a s s r s l- r s o o so. o a o r s o l o or o ro or o r s s ss a l r . , a sa , o s s ar r so r s l as - os ly (os) ay s also l r s .

INVISIBLE HAND The tendency of firms and resource suppliers seeking to further their own self-interests in competitive markets to also promote the interests of society as a whole.

KEY CONCEPTS The Effectiveness of Markets

o r or - r - -l ss- l ll s ra o , s s l - r s a s r s o s s a ro r a o a so y's a s. s ss s s o a r ro s a o a o loss s, a r so r s l rs rs r a r o - ary r ar s, o a a s allo a o o r so r s a o a so y a s. o o o rols or s s l - r s s a ay a a o a ally, a o ally, r rs s r s s o so y. s l a s r s s a r s a r ro s, y also a so y's o a o .

a y r s o ar sys , r r s al as s

- *Efficiency* as o o ar or ar sys s a ro- o s s o r so r s, y o ro o o os oo s a s r s os a y so y. or s s o os s or a r so r s or ro o , a o ra s l- o a a o o o a or ro o s.
- *Incentives* ar sys o ra s s ll a s o , ar or , a o a o . Gr a r or s lls a or a r a r ro o a r o s, ra sla o a r s a ar o l . larly, ass - o r s s y r r rs a r s l s s a al ro o s. ss- l o a o s ra o o r ar s.
- *Freedom* a or o - o o ar or ar sys s s as s o rso al r o . o ras o ral la , ar sys- oor a s o o a y o o r o . ar sys r- s , r so r o o r r s a o . r r rs a or rs ar r o r r r o s l - r s , s o r ar s a al s os y ar sys s l .

QUICK REVIEW

- The output mix of the market system is determined by profits, which in turn depend heavily on consumer preferences. Profits cause efficient industries to expand; losses cause inefficient industries to contract.
- Competition forces industries to use the least-costly (most efficient) production methods.
- In a market economy, consumer income and product prices determine how output will be distributed.
- Competitive markets reallocate resources in response to changes in consumer tastes, technological advances, and changes in supplies of resources.
- The "invisible hand" of the market system channels the pursuit of self-interest to the good of society.

MARKET FAILURE

The Role of Governments

ar sys as a y os as s s a o r. or a ly, r ar s a s o s ' or . *Ma ke fail e* o rs o ar sys (1) ro s ro a o s o r a oo s a s r s or (2) a ls o allo a a y r so r s a so r o ro o o r a oo s a s r - s a ar o o ally s . rs y o a l r r s l s ro a o - o s s all *illo e* , a s o y ol s *blic good* . o s o ar a l r a orr y o r a o .

Spillovers or Externalities

say a o ar s a o a ally r a o s o r so r s, ass a all s a os s or a ro ar lly r ar a a s ly r s. a s o al ays as . so ar s r a s or os s ay s a y r or s ll r. s llo ro rs so o os s or s o a oo ar ass o o or s llo r o so o o r a a y r or s ll r. llo rs ar also all *e e nali ie* a s y ar s or os s a a r o so r ar y a s r al o ar ra sa o .

SPILLOVER COSTS

SPILLOVER COSTS A cost imposed without compensation on third parties by the production or consumption of sellers or buyers.

ro o or o s o os s o a r ar y o o sa o ar all **spillover costs.** ro al oll o s a a l . a al a a r r or a a a la s s as s o a la or r r, s - rs, s rs, a oa rs a r a s os o r a r s r s ll- o r os s. a rol r ry oll s a r s o or a a r ll r a s o o o s o o rs, o y r s s llo r os s or s o o sa .

a ar o o s all a os s r os o o r 's s ly r . a r a o s so os s y oll , s s ly r l s ar r o r a o s r ars ll os s o ro o . s a r s l , r o ro s oo lo a o o ro s oo lar o a allo a y. ar a l r o rs or o a o r- allo a o o r so r s o ro o o oo .

CORRECTING FOR SPILLOVER COSTS

Go r a o o s o orr o rallo a o o r so r s. o sol - o s ar s o r al r al os s a s, o a o r ay os s ra r a s o o rs

- ***Legislation*** as s o a r a a r oll o , os r a o s l - sla o ro or l oll o . l sla o or s o al oll rs o ay or ro r s osal o s r al as s r , y s all s o -a a or a r- r a o a l s. a s o or o al o rs, r r a o l al a o , o ar *all* os s asso a ro o .
- ***Specific taxes*** l ss r a o s as o a a a s ar a os a r or a r a o a r ’s s ly r . Go r l y a *eci c a* a s, a a o o a ar lar ro o a o oll r ’s o . a o o s a o l ro ly al s - a a o o s llo r os ar s ro ro o o a o o . ro s a , o r o l ass a o o r a os al o s llo r os r s a o . s o l s r ’s s ly r o l , r l r o a l a o rallo a o o r so r s.

SPILLOVER BENEFITS

o s s llo rs a ar as s. ro o or o s o o r a oo s a s r s ay o r s llo r or r al s o r ar s or o o y a lar o o sa ay . a o a a s asl s a ol or s l s r s o a o s r o os a - s. also r s l s s r a s s a al s llo r s o r o y.

SPILLOVER BENEFIT A benefit obtained without compensation by third parties from the production or consumption of sellers or buyers.

a o s a o r a l o **spillover benefits**. a o s - al o s rs r- a o l rally a r o s a l ss- ll- a o l . a o also ro s s o so y, or o a or rsa l a or ro la o r or , o o a , a s all r o lays or r r o , la or , a l ar ro ra s, o o r.

llo r s a a ar a r , r s o ly r - a s, rs a s o al s. a r or ro l s ar- r o l a o l ar oo all s o a o . s ar s l, a s all r a o o ro ll ro or, al r a ly, r ll a *nde alloca ion* o r so r s o ro a a a ar a l r .

CORRECTING FOR SPILLOVER BENEFITS

o rallo a o o r so r s asso a s llo r s orr a s r s r o s s o s rs (o r as a), o s s ro rs (o r as s ly), or, r , o a o r ro ro .

- ***Subsidize consumers*** o orr rallo a o o r so r s o r a o , ral a ro al o r s ro lo - r s loa s o s s so a y a a or or a o . os loa s r as a or r a o .

- ***Subsidize suppliers*** so as s o r s or o a a s ra ly s l r o orr a rallo a o y s s s l- rs. or a l , r a o , ro al o r s ro s - s a al or o s o s o oll s a rs s. s s s lo r os s o ro r a o a r as s s ly. l ly s s a o ro ra s, os als, a al r s ar ar o r a l s.
- ***Provide goods via government*** r ol y o o ay a ro r a r s llo r s ar r ly lar Go r ay a or, r , o a o ra s ry a s ol .

Public Goods and Services

r a oo s all *i a e good* ar oo s ro ro o ar- sys a ar sa o *di i ible* a s y ar ro s s all o o r as a s y al y rs. a l s ar a y s sol s or s. r a oo s ar also s o **exclusion principle**. y- rs o ar ll a a l o ay r o ro o a , os o ar a l or ll o ay ar *e cl ded* ro a r ro a s s.

EXCLUSION PRINCIPLE The ability to exclude those who do not pay for a product from receiving its benefits.

r a o r oo s a s r s, all **public goods**, a o os ara - r s s. l oo s ar *indi i ible* y s ro s lar s a y a o or ar ly sol o al y rs. als a y a r - rs, o rs, a a o o l s ro ar y a o y a r ra arr rs, ays, or s a l s o s.

PUBLIC GOOD A good or service that is indivisible and to which the exclusion principle does not apply.

The e cl ion inci le doe no a l o blic good s r s o ay o l als ro r s o s oo s o o s . a s o r a oo s r r s a y *cha ed* o a s o oo s r r s o ly a y *a ailable.*

lass a l o a l oo s a ro os l o s o a r a ro s oas . o s r o o l o s o l o o ally s s - s (r s r s) s os . s a r o a s l s r o l o r a o o s y r as o s a s l ro . or o r, o as o ra o , ar l o l a o *all* s s r o l o ra al ay o l a y a a ro s l . o - o s s all s **free-rider problem**, o l r s ro a oo o o r o s os .

FREE-RIDER PROBLEM The inability of potential providers of an economically desirable but indivisible good or service to obtain payment from those who benefit, because the exclusion principle is not applicable.

a s s r s o l o s a o r a sol , o l ro a l or a r a r o o r so r s o . o r a a s r a o l y l s s a al s o ar sys o l allo a or so r s. s a l oo , l a o al , oo o rol, a - l al . o y s als s s r or s oo s y o or ar lar ol al a a s o s or r ro s o . oo s s l s s ro y l s or a a y o lsory ar s or o a s.

Quasi-Public Goods

Go r ro s a y oo s a o o s 's o o a l oo . o r, also ro s o r oo s a s r s a o l ro a l r s a ay a l s o r l o l a ly. oo s, all **quasi-public goods**, l a o , s r s a ays, ol a

QUASI-PUBLIC GOOD A good or service to which the exclusion principle could apply, but that has such a large spillover benefit that government sponsors its production to prevent an underallocation of resources.

r ro o , l rar s a s s, r , a s a s- osal. y o l all r a ro y r a r s ro ar sys . , as o arl r, a s y all a s s a al s llo r - s, y o l r ro y ar sys . r or , o r o ro s o a o rallo a o o r so r s a o l o r- s o r.

The Reallocation Process

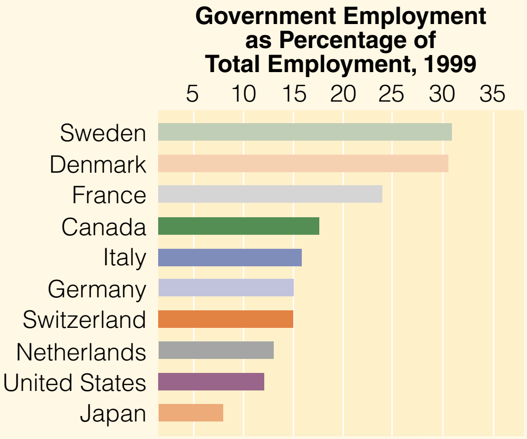
o ar r so r s r allo a ro ro o o r a oo s o ro - o o l a as - l oo s r so r s o o o y ar lly loy , o r s r r so r s ro ro o o r a oo s a a a a la l or ro o o l a as - l oo s. o s so y r r a a or . o s a y l y a so o s - ol s a s ss s, a so o r o o o r lar o . lo r o s a l ss r as o r, o s ol s a s ss sar o l o r a l r o s o a s s . s a r s l , r a a or oo s a s r s l s, as o s r a a or r so r s. o y r r as o r ro r a s rs o o r , a s r o r so r s ro r a s . (Glo al rs .2 s o s o ar - o s o r s r la o r ro r a s or o l s or.)

Go r s s a ro s o ro l a as - l oo s a s r s. a a o r l as s r so r s ro ro o o r a o s r oo s (oo , lo , l s o s s) a r a s s oo s (r r ss s, o ars, ar o s s). Go r s s os r so r s o ro o o l a as - l oo s (os o s, s ar s, ar s), a o os o o o o y’s o al o . (*Key Questions 11 and 12*)

GLOBAL PERSPECTIVE 4.2

Government employment as a percentage of total employment, selected nations

The ratio of government employment to total employment measures the extent to which government diverts labour resources from the private sector in order to produce public goods and quasi-public goods. The ratio, or percentage, varies greatly among nations.



Source: Organization for Economic Cooperation and Development.

QUICK REVIEW

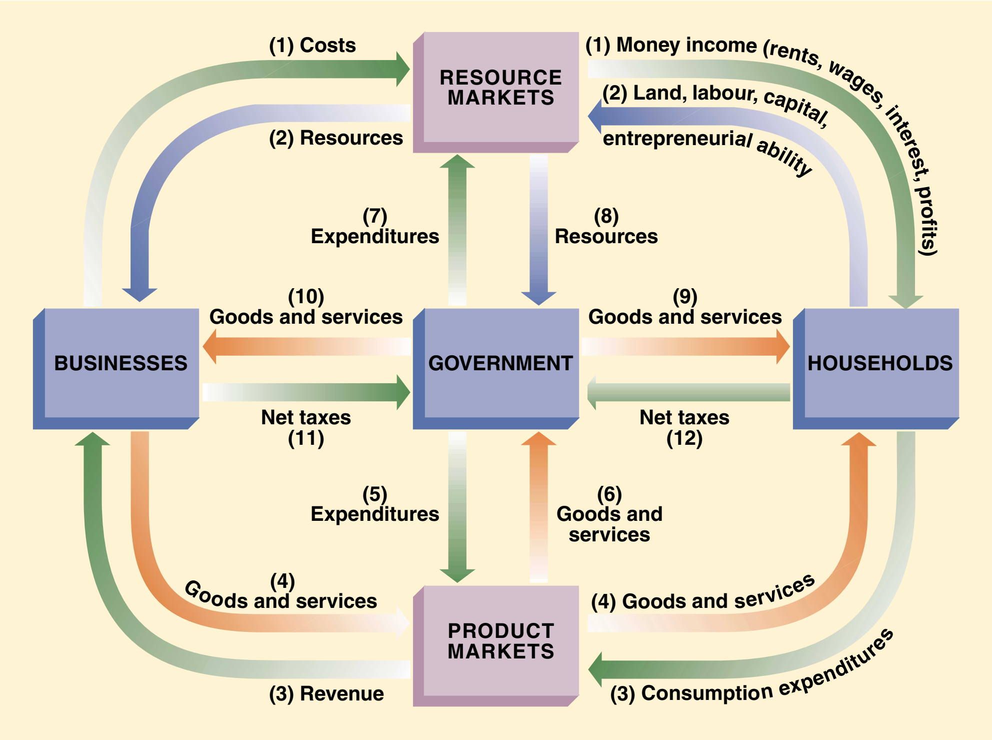
- Government can correct for the overallocation of resources associated with spillover costs through legislation or taxes; it can offset the underallocation of resources associated with spillover benefits by granting government subsidies.
- Government provides certain public goods because they are indivisible and free-riders can obtain them without payment; government also provides many quasi-public goods because of their large spillover benefits.

THE CIRCULAR FLOW REVISITED

r -2 ra o r o r lar o o l rs s o
r 2- . r o s (1) ro ( ) ar sa as orr s o o s
a r . lo s (1) a (2) s o s ss r s or r so r s ro
y o s ol s. s r s ar os s o s ss s r r s a , r ,
r s , a ro o o o s ol s. lo s ( ) a ( ) s o o s ol -
r s or oo s a s r s ro y s ss s.
o o s r a a s a o r . lo s ( ) ro ( )
ll s ra a o r a s r as s o ro a r so r ar s.
lo s ( ) a ( ) r r s o r r as s o s ro s as a r, o -
rs, a l ary ar ar ro r a s ss s. lo s ( ) a ( ) r r s

FIGURE 4-2

Government buys products from the product market and employs resources from the resource market to provide public goods and services to households and businesses. Government finances its expenditures through the net tax revenues (taxes minus transfer payments) it receives from households and businesses.



o r r as s o r so r s. ral o r loys a ays salar s o rs o arl a , ar or s, la y rs, a s ors, a so o . ro al a al o r s r a ay a rs, s r rs, ol , a r rs. ral o r also l as or r as la o a a l ary as a a y y la o o l a l ary s ool.

Go r ro s l oo s a s r s o o o s ol s a s ss s as s o y o s ( ) a (10). o a os l oo s a s r - s, s ss s a o s ol s ar r r o ay a s, as s o y o s (11) a (12). s o s ar la ll as *ne* a s o a a y also l a s r rs or o ra s r ay s o o s ol s a s s s o s ss s. s, o (11) a ls ar o s s s s o ar rs, s l rs, a a rl s as ll as o , sal s, a s a s a y s ss s o o r . os s s s o s ss ar o al or o lo - r s loa s, loa ara s, a o ss o s, or l a l s ro a r s lo r os . larly, o (12) l s o a s oll y o r r ly ro o s ol s a ra s r ay s s as l ar ay s a so al s ra s a y o r .

a s r -2 o r o o r al rs s r o o o , r allo a s r so r s, a a s l l o o o a y. s r - r o a s a ra s r ay s s a ly a s o s r o . o (12), a a s r r a ra s a r s r ar ly ro ll- o- o o s ol s, o a sys o ra s r ay s o lo - o o s ol s, r s o al y.

lo s ( ) ro ( ) ly a o r r s oo s a r so r s a ay ro r a s or o s o or s a r s o l s or. s r so r r allo a o s r r o ro l oo s a s r s.

THE STRUCTURE OF THE CANADIAN ECONOMY AND ITS EVOLUTION OVER TIME

a l -1 s so o r o o a a a o s o (G) y a s - or a s ry. o o y o s s s o r a s ors *ima* , *econda* , a *e ia* . r ary s or o s s s o a r l r a a ral r so r s, l s a . s o ary s or l s a a r , o s r o , ra s or a o a o a o , a l s. r ary, or s r , s or a s r s o o o y, a s o y ar lar s ar o a a a o o y.

Sectoral Shifts over Time

ors a o ally a o r , as so a s r s l o rs a a . or a l , r ary s or, a a r l r ar lar, as s r s o s o s r al a o ry. a l -2 s o s loy s ar o a s or a s s or. r - l r 's loy as all ro a o a ar r o la o r or 1 o r r 2000. a a r as also r a l loy- s ar , l s l ss ro o . s r s or as o o os s loy s ar as or a o l s orl ar . s rs oral s s o r r ar ly a s o olo al a a , r s a o r as s ro y. or a l , l r as a

TABLE 4-1 PRODUCTION SHARES BY SECTOR, SELECTED YEARS 1870-2000

	% OF GROSS DOMESTIC PRODUCT AT FACTOR COST							
	1870	1911	1926	1960	1970	1980	1986	2000
PRIMARY	46.2	39.4	23.4	10.4	8.3	11.2	10.0	5.8
Agriculture	34.3	30.8	18.1	4.9	3.3	3.3	3.3	1.9
Forestry*	9.9	4.6	1.3	1.3	0.8	0.9	0.7	0.3
Fishing and trapping	1.1	1.5	0.8	0.2	0.2	0.2	0.2	0.1
Mining, quarrying, oil wells	0.9	2.5	3.2	4.0	4.0	6.8	5.8	3.5
SECONDARY	22.6	29.7	38.7	44.8	41.4	38.3	36.7	35.4
Manufacturing	na	18.8	21.7	26.4	23.3	20.6	19.5	18.2
Construction	na	10.3	4.1	6.0	6.3	5.9	7.0	5.4
Transportation and communication	na	na	12.9	9.6	8.9	8.3	7.3	8.5
Electric power, gas, and water utilities	na	0.6		2.8	2.9	3.5	2.9	3.3
TERTIARY	31.2[a]	30.8[a]	37.9	44.8	50.2	50.5	53.3	58.8
Trade (wholesale, retail)	na	na	11.6	12.8	12.4	11.0	11.7	12.8
Finance, insurance, real estate	na	na	10.0	11.6	11.3	11.3	14.1	16.1
Public administration, defence	na	na	3.4	6.9	7.3	7.4	7.2	6.0
Service	na	na	12.9	13.5	19.2	20.8	20.3	23.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

[a] l s o ra y ra l ay a l o s r s.

* r or or s ry al la as a r s al.

o r a a or 1 0 o 1 ro . Gr , *Canadian Ind ial O gani a ion and Polic* (oro o Gra - ll y rso ., 1 0), . . a a or 2000 al la ro a s s a a a, .s a s s a a a. a/ l s / / o o y/ o o / o 1. .

s . ra ll. a/ oll / o ll or a a a .

Σ-STAT

o o s l a r l r ’s loy s ar , as o a o a s o lar r as s la o r (a la) ro y. r as la o r ro - y a s r o l ar a s or, l ss r s a r as a or a r l ral ro s. r s a l o o a a , a r l ral la o r a r a a a o or o r o s ors, ar larly s o ary (a a r) s or.

orl ar , s o ary s or as los loy s ar as ro y a s or ros . a a r ar lar as s a s a ro s loy s ar . a l -1 s o s a a r ’s G s ar ro ro 2 r 1 0 o a o 1 r 2000. a l -2 a s a loy s ar o a a r as ro s a ly s 1 . ro o r a ar r o la o r or , a a r o loys o ly a o 1 r .

Foreign Ownership

s s ara r s o a a a o o y s a a r a s or o , ar larly y r a s. r *fo eign o ned* rally a s o r o rs o a r or o a l as 1 r o s o s.

TABLE 4-2 EMPLOYMENT SHARES (%) BY ECONOMIC SECTOR AND INDUSTRY

	1891[a]	1921[a]	1947	1960	1970	1980	1987	2000
PRIMARY	49	36	27.5	14.3	9.3	7.3	6.4	4.4
Agriculture			24.1	11.3	6.5	4.5	4.0	2.5
Forestry			1.2	1.1	0.9	0.7	0.6	1.9
Fishing and trapping			0.7	0.4	0.3	0.3	0.3	
Mining, quarrying, oil wells			1.5	1.5	1.6	1.8	1.5	
SECONDARY	31	34	40.3	40.7	37.5	34.0	30.4	26.7
Manufacturing			26.7	24.9	22.7	19.7	17.1	15.3
Construction			5.2	7.2	6.0	5.8	5.7	5.5
Transportation and communication			7.7	7.5	7.7	7.3	6.6	5.2
Public utilities			0.7	1.1	1.1	1.2	1.0	0.7
TERTIARY	20	30	32.1	45.0	53.2	58.7	63.2	68.9
Trade (wholesale, retail)			12.3	16.2	16.7	17.2	17.7	15.6
Finance, insurance, real estate			2.7	3.8	4.6	5.7	5.8	5.8
Community, business, personal services (including health, education)			17.1	25.0	25.7	28.9	32.9	42.4
Public administration					6.2	6.9	6.8	5.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

[a] as o o a o al a a all l r al or rs ar allo a o r ary s or a all o r ary s or la o r rs ar allo a o s o ary s or.
o r a a or 1 1 o 1 ro . Gr , *o . ci* . (oro o Gra - ll y rso ., 1 0), . . a a or 2000 al la ro a s s a a a, .s a s s a a a. a/ l s / / o o y/ o o / o 0. .
s . ra ll. a/ oll / o ll or a a a .

Σ-STAT

or o rs as os s a s. l s o as r os s a s, s o s r r s a ss o or o rs o aro s s s ro o o s. r a s os s r o s a sa o a a s or o - rs s a o ar s a a a’s ol al a o o y. o r, s a a sa- o s l o ro or s ro .

r ar ar o s la a o s o o or o rs o a a a o o y. o a r o r la ly a a a ar s s - l a o o a o al ol y 1 . or r s o l ’ o y or r a s o ar s, y s a l s or r as ro o a l s a a a. r as a la s, allo o ro o o a or a o r, also l o s la or o rs as r s o a o a r olo s a ly s a l s - s l s a a a. r o ry’s ro y o a s as also o o l r as or o rs , as r a r s a a a as a - s o o r o s ar .

ll s la a o s a so r . o r, all a a sa r- a y s a or r s o s a l s ro a a s a a a, s a a s as os ro a l al r a .

The LAST word

MARKET FAILURE AND THE NEED FOR GOVERNMENT

Private markets fulfil individual desires very well, but where there is a need for collective action, they often fail.

Suppose a municipality requires a new road. In the absence of a government request that a private firm build it, it is unlikely that a private firm will build the required road on its own initiative. Or, to express it in another way, private markets will not make available public goods. The citizens of the municipality have to elect a government to either direct a private firm to build the road, or hire people to buy the capital equipment needed to construct the road on its own.

Why would a private firm not undertake to build a road on its own? The obstacle is common property rights. The land on which the road is to be built must be owned by the firm before it would consider building the road. Lands used by all citizens are most often held publicly. The firm would thus need to get the consent of all the citizens affected. Such unanimity would be difficult to achieve. Indeed, it is the difficulty of making collective decisions that makes governments essential to the creation of an infrastructure—such as roads and airports—necessary to facilitate the functioning of markets. Not only must a decision be made to build the road, but then the decision must be made as to who should bear the cost. The free-rider problem arises here. Every individual hopes someone will pay for the needed road. This way he or she can have the benefits without contributing to its cost. The free-rider problem can potentially arise in all situations where collective action must be taken. Unless we have a central authority—government—with the monopoly power to impose costs on all members of a society, many socially useful projects will not be undertaken.

In a pathbreaking book, *The Logic of Collective Action*,[1] Mancur Olson pointed out some 30 years ago that contrary to popular belief, groups of individuals with common interest do not necessarily attempt to further those common interests. In many instances group members attempt to further their own personal interests. A few years later, the political scientist Garrett Hardin popularized the term "the tragedy of the commons"[2] to describe the problems that arise when there are common property rights. For example, where there are common property rights to a natural resource, it is typically overexploited. The cod stocks on Canada's east coast have suffered just that fate.

Where collective action is required, or where there are common property rights, governments are needed because markets fail to bring together the interests of the individual and those of society. The federal government has had to impose mandatory fishing restrictions to save the cod stocks from dwindling further. Governments must make decisions to construct a road, otherwise the road might never get built. Clearly, markets work best where there are private property rights.

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[1] Mancur Olson, *The Logic of Collective Action* (Cambridge: Cambridge University Press, 1965).

[2] Garret Hardin, "The Tragedy of the Commons," *Science* 162 (1968): 1243–48.

CHAPTER SUMMARY

1. The market system—known also as the private-enterprise system or capitalism—is characterized by the private ownership of resources, including capital, and the freedom of individuals to engage in economic activities of their choice to advance their material well-being. Self interest is the driving force of such an economy, and competition functions as a regulatory or control mechanism.
2. In the market system, markets and prices organize and make effective the many millions of individual decisions that determine what is produced, the methods of production, and the sharing of output.
3. Specialization, use of advanced technology, and the extensive use of capital goods are facilitated by the market system.
4. Functioning as a medium of exchange, money eliminates the problems of bartering and permits easy trade and greater specialization, both domestically and internationally.
5. Every economy faces Four Fundamental Questions: (a) What goods and services will be produced? (b) How will the goods and services be produced? (c) Who will get the goods and services? (d) How will the system used accommodate changes in consumer tastes, resource supplies, and technology?
6. The market system produces those products of which production and sale yield total revenue sufficient to cover all costs, including a profit (a cost). It does not produce those products that do not yield a profit.
7. Profit indicates that an industry is prosperous and promotes its expansion. Losses signify that an industry is not prosperous and hasten its contraction.
8. Consumer sovereignty means that both businesses and resource suppliers are subject to the wants of consumers. Through their dollar votes, consumers decide on the composition of output.
9. Competition forces firms to use the lowest-cost and therefore the most economically efficient production techniques.
10. The prices that a household receives for the resources it supplies to the economy determine that household's income. This income determines the households claim on the economy's output. Those who have income to spend get the products produced in the market system.
11. By communicating changes in consumer tastes to resource suppliers and entrepreneurs, the market system prompts appropriate adjustments in the allocation of the economy's resources. The market system also encourages technological advance and capital accumulation.
12. Competition, the primary mechanism of control in the market economy, promotes a unity of self-interest and social interests; as though directed by an "invisible hand," competition harnesses the self-interest motives of businesses and resource suppliers to further the social interest.
13. Spillovers, or externalities, cause the equilibrium output of certain goods to vary from the socially efficient output. Spillover costs result in an overallocation of resources, which can be corrected by legislation or by specific taxes. Spillover benefits are accompanied by an underallocation of resources, which can be corrected by government subsidies to consumers or producers
14. Only government is willing to provide public goods, which are indivisible and entail benefits from which non-paying consumers (free riders) cannot be excluded. Private firms will not produce public goods. Quasi-public goods have some of the characteristics of public goods and some of the characteristics of private goods; government provides them because the private sector would underallocate resources to their production.
15. In terms of both employment share and contribution to domestic production, the service sector dominates in the Canadian economy.

TERMS AND CONCEPTS

barter, p. 80
competition, p. 78
consumer sovereignty, p. 83
creative destruction, p. 85
derived demand, p. 83
division of labour, p. 80

dollar votes, p. 83
exclusion principle, p. 89
firm, p. 82
Four Fundamental Questions, p. 82
freedom of choice, p. 77
freedom of enterprise, p. 77
free-rider problem, p. 89
guiding function of prices, p. 85
household, p. 82
"invisible hand," p. 86
medium of exchange, p. 80
money, p. 81
private property, p. 76
public good, p. 89
quasi-public good, p. 89
roundabout production, p. 79
self-interest, p. 77
specialization, p. 79
spillover benefits, p. 88
spillover costs, p. 87

STUDY QUESTIONS

1. Explain each of the following statements:

- **a.** The market system not only accepts self-interest as a fact of human existence, it relies on self-interest to achieve society's material goals.
- **b.** The market system provides such a variety of desired goods and services precisely because no single individual or small group is deciding what the economy will produce.
- **c.** Entrepreneurs and business are at the helm of the economy, but their commanders are consumers.

2. Why is private property, and the protection of property rights, so critical to the success of the market system?

3. What are the advantages of "roundabout" production? What is meant by the term "division of labour"? What are the advantages of specialization in the use of human and material resources? Explain: "Exchange is the necessary consequence of specialization."

4. What problem does barter entail? Indicate the economic significance of money as a medium of exchange. What is meant by the statement "We want money only to part with it"?

5. Evaluate and explain the following statements:

- **a.** The market system is a profit-and-loss system.
- **b.** Competition is the indispensable disciplinarian of the market economy.
- **c.** Production methods that are inferior in the engineering sense may be the most efficient methods in the economic sense, once resource prices are considered.

6. Explain the meaning and implications of the following quotation.

> The beautiful consequence of the market is that it is its own guardian. If output or prices or certain kinds of remuneration stray away from their socially ordained levels, forces are set into motion to bring them back to the fold. A curious paradox thus ensues: the market, which is the acme of individual economic freedom, is the strictest taskmaster of all. One may appeal the ruling of a planning board or win the dispensation of a [government] minister; but there is no appeal, no dispensation, from the anonymous pressures of the market mechanism. Economic freedom is thus more illusory than at first appears. One can do as one pleases in the market. But if one pleases to do what the market disapproves, the price of individual freedom is economic ruination.[1]

7. Suppose the demand for bagels rises dramatically while the demand for breakfast cereal falls. Briefly explain how the competitive market economy will make the needed adjustments to re-establish an efficient allocation of society's scarce resources?

8. **KEY QUESTION** Some large hardware stores, such as Canadian Tire, boasts of carrying as many as 20,000 different products in each store. What motivated the producers of those products—everything from screwdrivers to ladders to water heaters—to make them and offer them for sale? How did the producers decide on the best combinations of resources to use? Who made those resources available, and why? Who decides whether these particular hardware products should continue to get produced and offered for sale?

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[1] Robert L. Heilbroner, *The Worldly Philosophers*, 7th ed. (New York: Simon & Schuster, 1999), pp. 57–58.

9. In a single sentence, describe the meaning of the phrase "invisible hand."

10. What divergences arise between equilibrium output and efficient output when (a) spillover costs and (b) spillover benefits are present? How might government correct for these divergences? "The presence of spillover costs suggests the underallocation of resources to a particular product and the need for governmental subsidies." Do you agree? Why or why not? Explain how zoning and seat belt laws might be used to deal with a problem of spillover costs.

11. KEY QUESTION What are the characteristics of public goods? Explain the significance of the exclusion principle. By what means does government provide public goods?

12. KEY QUESTION Draw a production possibilities curve with public goods on the vertical axis and private goods on the horizontal axis. Assuming the economy is initially operating *on the curve*, indicate how the production of public goods might be increased. How might the output of public goods be increased if the economy is initially operating at a point *inside the curve*?

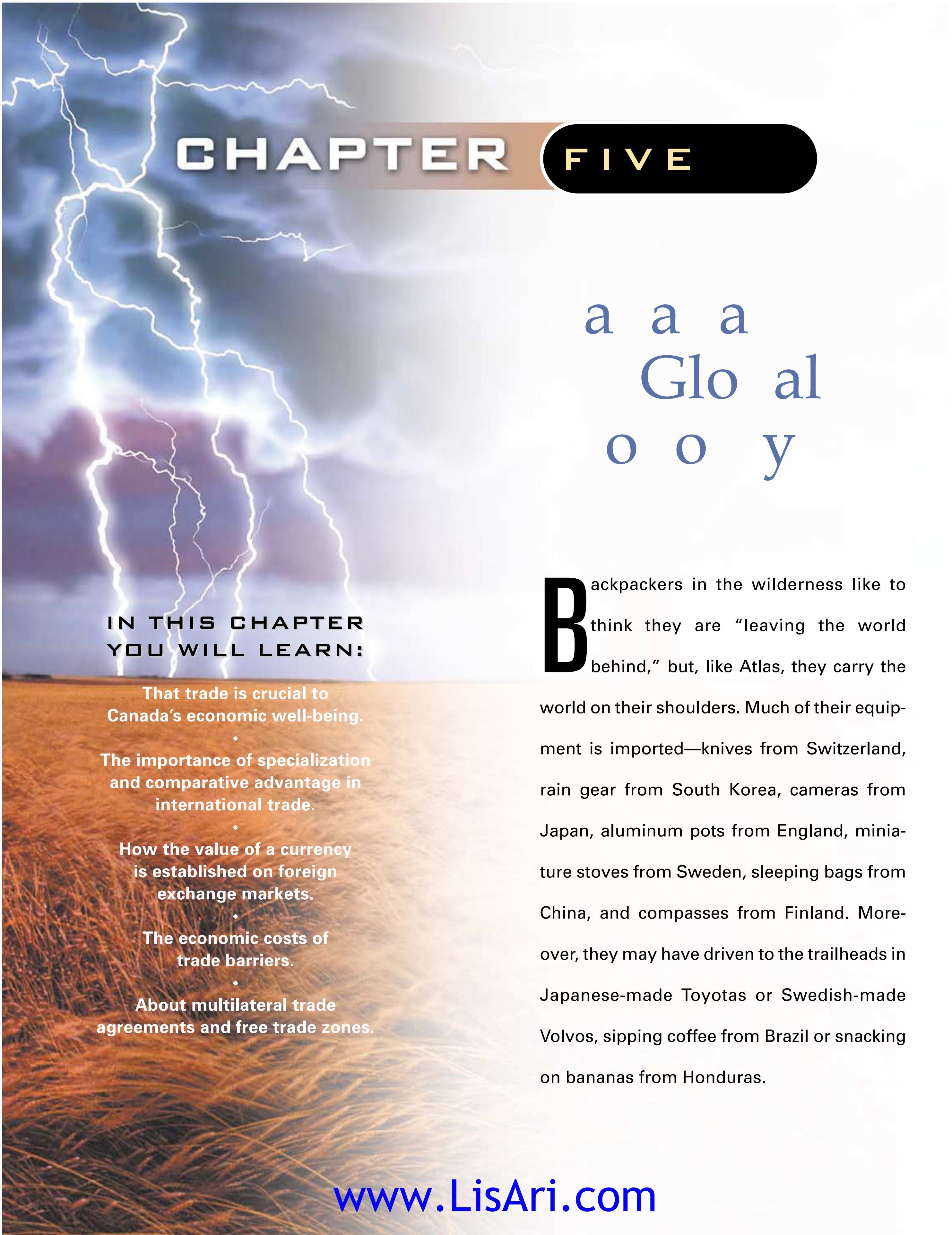
13. Use your understanding of the characteristics of private and public goods to determine whether the following should be produced through the market system or provided by government: (a) bread; (b) street lighting; (c) bridges; (d) parks; (e) swimming pools; (f) medical care; (g) mail delivery; (h) housing; (i) air traffic control; (j) libraries. State why you answered as you did in each case.

14. **(The Last Word)** Why do private markets fail? In your answer, refer to the dwindling cod stocks on Canada's east coast.

INTERNET APPLICATION QUESTIONS

1. **Sparkly Things—Interested in Buying One?** Go to the Internet auction site eBay at www.ebay.com/index.html and click the category *Jewelry, Gemstones*. How many diamonds are for sale at the moment? How many rubies, sapphires, and opals? Note the wide array of sizes and prices of the gemstones. In what sense is there competition among the sellers in these markets? How does that competition influence prices? In what sense is there competition among buyers? How does that competition influence prices? See something interesting, there or elsewhere on eBay? Go ahead and buy it!

2. **Barter and Canada Revenue** Bartering occurs when goods or services are exchanged without the exchange of money. For some, barter's popularity is that it enables them to avoid paying taxes to the government. How might such avoidance occur? Canada Revenue's interpretation of barter transactions can be found at www.ccra-adrc.gc.ca/E/pub/tp/it490et/it490e.txt.html. Does Canada Revenue treat barter as taxable or nontaxable income? How is the value of a barter transaction determined?



CHAPTER FIVE

Canada in the Global Economy

IN THIS CHAPTER YOU WILL LEARN:

That trade is crucial to Canada's economic well-being.

•

The importance of specialization and comparative advantage in international trade.

•

How the value of a currency is established on foreign exchange markets.

•

The economic costs of trade barriers.

•

About multilateral trade agreements and free trade zones.

Backpackers in the wilderness like to think they are "leaving the world behind," but, like Atlas, they carry the world on their shoulders. Much of their equipment is imported—knives from Switzerland, rain gear from South Korea, cameras from Japan, aluminum pots from England, miniature stoves from Sweden, sleeping bags from China, and compasses from Finland. Moreover, they may have driven to the trailheads in Japanese-made Toyotas or Swedish-made Volvos, sipping coffee from Brazil or snacking on bananas from Honduras.

r a o al ra a lo al o o y a all o s a ly, r ar - l r ss, r o r ars, l s o s , or or a o r o s. a o l a orl . ar s a lo al o o o r la o s s ra o oo s a s r s, l a o al or ora o s, oo ra- r s a o orl 's r s, a s a o orl 's a al ar- s. a s so o l a s l o r s a s or s ' a a a a ro . s o a y o s lso s or oo s a ss o - a y o s G r r a y oo a a r s or ora o o s r r . oy- o a orolla s a s a a r a a a. a y a a a ro s ar a o o s ro a roa , a , o rs ly, a y or ro s o a ro s a a a - ro ar s.

INTERNATIONAL LINKAGES

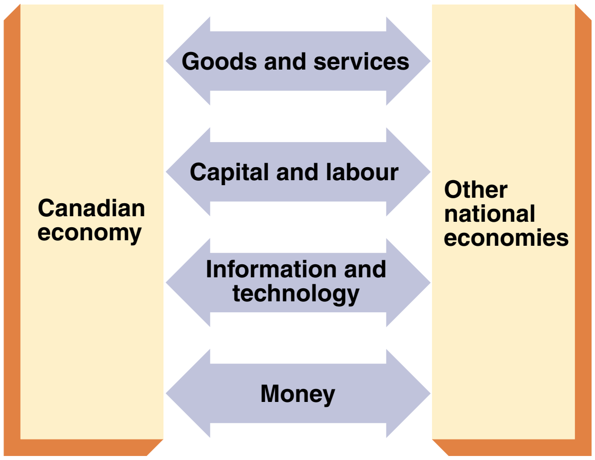
www.oecd.org/eco/out/eo.htm
OECD Economic Outlook

ral o o o s l a a a o o y a o o s o o r a o s. s r -1, s o s ar

- *Goods and services flows* or s ly *trade flows* a a a or s oo s a s r s o o r a o s a or s oo s a s r s ro .
- *Capital and labour flows* or s ly *resource flows* a a a r s s a l s ro o a l s a al or o r s a or r s s a l s ro o a l s a a a. a o r also o s a o s. a y ar a y or rs ra o a a a a so a a a s o o o r a o s.
- *Information and technology flows* a a a ra s s or a o o o r a o s a o a a a ro s, r , r s ra s, a s o or- s a r s s or a o ro a roa . r s o r o r s s olo y r a a a a a a a a s ss s or ora - olo y lo a roa .

FIGURE 5-1

The Canadian economy is intertwined with other national economies through goods and service flows (trade flows), capital and labour flows (resource flows), information and technology flows, and financial flows.



- *Financial flows* o y s ra s rr a a a a o r o r s or s ral r os s, or a l , ay or or s, y or ass s, ay r s o , a ro or a .

CANADA AND WORLD TRADE

r a oal s a r s o a ra o s a a al o s a ay or . a s a a r o r a o al ra a o as ro o ar a or ar a s

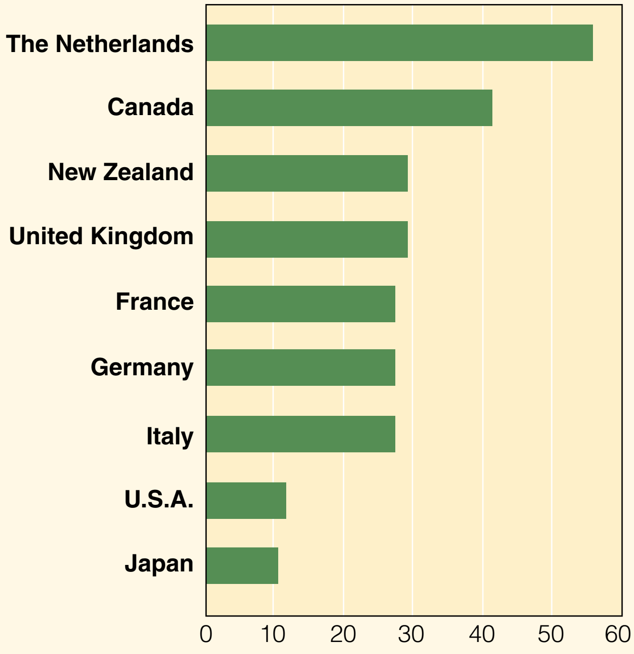
Volume and Pattern

Glo al rs .1 s s s or a o orl ra or s l o r s. a a a, a l o s ar , a o ly ro ar y o oo s s s a . o s or oo s ro o r a o s. a , r , a s a s or , or s ll a roa , so o o r o ro s. or a a a, or s a a o 0 r o o r ross o s o (G) ar al o all oo s a s r s ro a o o y. r o r s, a s, or a l , a a lar r al ar . l o o al ol o ra s a s, o s s a s all r r a o G a a ro o r a o s.

GLOBAL PERSPECTIVE 5.1

Exports of goods and services as a percentage of GDP, selected countries, 1999

Canada's exports make up almost 40 percent of domestic output of goods and services.



Source: IMF, *International Financial Statistics*, 2000

VOLUME

or a a aa or orl as a ol ol o r a o al ra as r as o a sol ly a r la o r G s. o ar so o o a a r -2 r als s s a al ro ollar a o o a a a or s a or s o r as s ral a s. ra s o s ro o a a a or s a or s o oo s a s r s as r a s o G . a a- a or s a or s rr ly ar a ro a ly 0 r o G , a o o l r r a s 1 .

DEPENDENCE

a a a s al os r ly o o r o r s or a a as, o oa, o - , s s, a, ra s l , l, , a ral r r, a a o s. or oo s o a a a oo s a y o o r o s ar s a a s ars, r a r a s, a ss a s r a s o s s ar a a l s.

o rs , orl ra s a o- ay s r . a y a a a s r s r ly o or- ar s. l os all s s o a a a a r l r r ly o sal s a roa or a l , or s o a , or , a o a o ary ro o - o r o or a o - al o o al o o os ro s. a a a o r, al, a r- ra , a o o l , a a ool s r s, a o a y o rs, s ll s a or o s o r o r a o al ar s. a l -1 s o s so o a or a a a or s a or s.

FIGURE 5-2

Canadian imports and exports of goods and services have increased in volume and have doubled as a percentage of GDP since 1971. (Source: Statistics Canada, CANSIM, series D15458 and D15471.) Visit www.mcgrawhill.ca/college/mcconnell9 for data update.

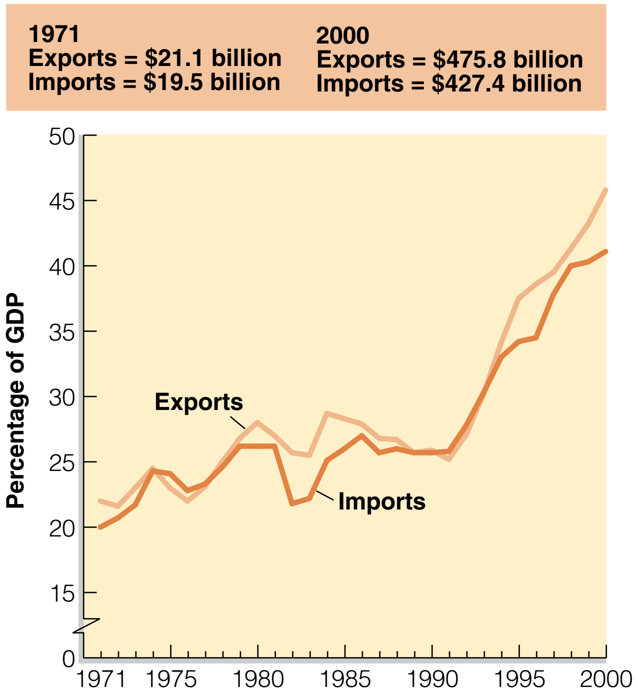


TABLE 5-1 PRINCIPAL CANADIAN EXPORTS AND IMPORTS OF GOODS, 2000

Exports	% of Total	Imports	% of Total
Machinery and equipment	25	Machinery and equipment	34
Automotive products	23	Automotive products	21
Industrial goods and materials	15	Industrial goods and materials	19
Forestry products	10	Consumer goods	11
Energy products	13	Agricultural and fishing products	5
Agricultural and fishing products	7	Energy products	5

o r a s s a a a, .s a s s a a a. a/ l s / / o o y/ r a o al/ l 0 .
s . ra ll. a/ oll / o ll or a a a .

Σ-STAT

TRADE PATTERNS

ollo a s ll yo a o r o r a o al ra

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- a a a as a *ade de ci* s r s (s as a o s r s a a al s r s). 2000, a a a or s o s r s or o s r s y $. ll o .
- a a a or s so o sa a or s o oo s a or s, s - ally, a o o l s ro s a a ry a (s a l -2).
- s a l -2 l s, a a a's or a or ra s o r s r - ally a a a o s, o lo o r s. (l o a a s a l ar or *good* o ly, sa ral a r a l s o *e ice*).
- a s s a a a's os or a ra ar r a a ly. 2000, r o a a a or oo s r sol o r a s, o r ro r o a a a's or s o oo s (s a l -2).

TABLE 5-2 CANADIAN EXPORTS AND IMPORTS OF GOODS BY AREA, 2000

Exports to	Percentage of total	Imports from	Percentage of total
United States	86	United States	74
European Union	5	European Union	9
Japan	3	Japan	3
Other countries	6	Other countries	14

o r a s s a a a, .s a s s a a a. a/ l s / / o o y/ r a o al/ l 02a.
s . ra ll. a/ oll / o ll or a a a .

Σ-STAT

FINANCIAL LINKAGES

r a o al ra r r s o l a al l a s a o a o s. o o s a a o o a or oo s ro o rs a ro s o a s r s y r orro ro or rs or y s ll r al ass s (or a l , a or s, r al s a) o .

Rapid Trade Growth

ral a ors a ro ll ra ro o r a o al ra s orl ar .

TRANSPORTATION TECHNOLOGY

ra s or a o os s ar a arr r o a y y o ra , ar larly a o ra rs o ar s a ro o a o r. ro s ra s or a o a s r lo a a os r orl ra . r la s o ra s or lo - , - al s s as a o s a s o ors s ly ro o a o o a o r. o ro ly ra s or o l ass a rs, s a ly lo r os o ra s or a o r arr l. Gra s loa o oo a - o s s a o - r , ra s los a Gr a a s a oas al or s. a ral as o s ro lar - a r l s ro or o or o r s or s a , ro ss a o G r a y a ro a a a o a s.

COMMUNICATIONS TECHNOLOGY

ra a ro s o a o s olo y a also a a orl ra . o rs, r , l o s, a a (a s l) a s o r ly l ra rs aro orl , a l or rs o ass ss o rs as ar- s a o arry o ra als. s r or a o r a a r o o 1000 o as s a la as ly as a o o 1000 la o o rs ar o. o y o s aro orl l o a y . a ra s, s o r s, a r s ra s as o o o r s r s arly s l a o sly oro o, o o , a s o .

GENERAL DECLINE IN TARIFFS

ar s ar s a s(s) o or ro s. y a a r s a o s o r y ars, s 1 0 y a rally all . la a a o r - s o s a a a a ar s as a r a o or s ar o a o r , o ro o r 0 r 1 0. a y a o s s ll a a arr rs o r ra , , o a ra , ar s a all s a ly, s r as r a- o al ra .

Participants in International Trade

ll a o s o orl ar a o so r a o al ra .

NORTH AMERICA, JAPAN, AND WESTERN EUROPE

MULTINATIONAL CORPORATION A firm that owns production facilities in other countries and produces and sells its product abroad.

s Glo al rs .2 a s, o ar a s orl ra y o al ol- ar a s, G r a y, a a a . 1 os r a o s a o - or s o $1. r ll o . lo G r a y, o r s r ro a a o s s as ra , r a , a aly ar a or or rs a or rs. a a a s orl ’s s lar s or r. a a a, a s, a a , a s r ro a a o s also or ar o orl ’s a al sys s a ro a ar rs or os o orl ’s lar s **multinational corporations** r s a a s a l ro o a s r o a s o r o r s. a l s o s r s ar l r (rla s), s l (rla), o a- ola (a s), ay r als (G r a y), s s (a a), a or l (a a a).

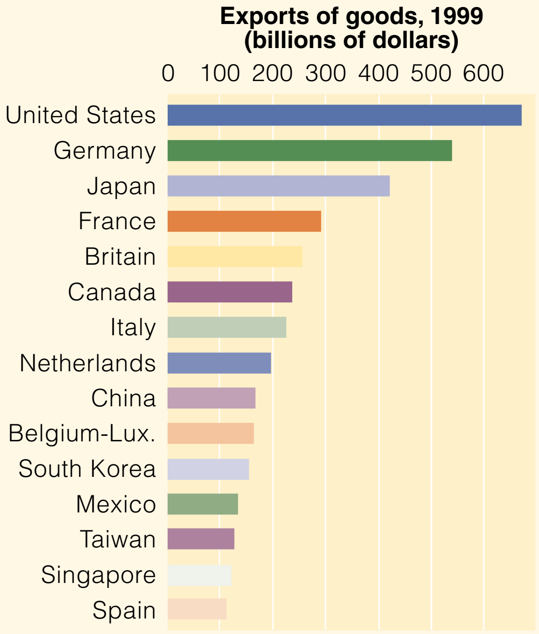
NEW PARTICIPANTS

or a ar a s a arr o orl ra s . ro s a o ly s r al s a o o s o o o (o ar o a), a or , o or a, a a a . l o s s a o o s r o o l s 1 0s, y a a r s ar o orl or s ro a o r 1 2 o or a 10 r o ay. o r,

GLOBAL PERSPECTIVE 5.2

Comparative exports

The United States, Germany, and Japan are the world's largest exporters. Canada ranks sixth.



Source: World Trade Organization, www.wto.org

y or a o as as r G r a y or a a a or a ra ,
r a , or aly. r o o s so as s a, ar larly alays a a
o s a, also a a r r a o al ra .

a, s r as r l a o ar sys , s a r a or
ra r. a ar r or s 1 , s a al ro o o as a r-
a r (o ar 2 o r a ally o r a r o a a a).
s r ar a l ra , a's o al o arly o l s ry y ars!
s r o or s a or s as a o a a a s o o o . 1 ,
s or s a or s r a a o $ 0 ll o . 1 , a o $200
ll o , r o a's or s o o a a a a a s.
lso, a as a ra s s a al or s (or a $ 00 l-
l o s 1 0).

olla s o o s as r ro a or r o o
arly 1 0s al r orl ra a r s. or a olla s , as r ro-
a a o s o ola , ary, oslo a a, a as G r a y ra a ly
o o a s ol al all s as or or a a a. o ay, as
G r a y s r s G r a y, a ola , ary, a
l a s a l s ra r la o s s s r ro , a a a,
a a s.

ss a s l as a ar-r a ar r or s, l s r a r-
a a o o s ry, a as a or ra als r s aro lo .
l o s ra s o o a al s as ar ro s oo , ss a ay o ay

a a or ra a o . r or r o r l s o a o s s as s o a a r a a also a o r o o s o r-a o al ra a a .

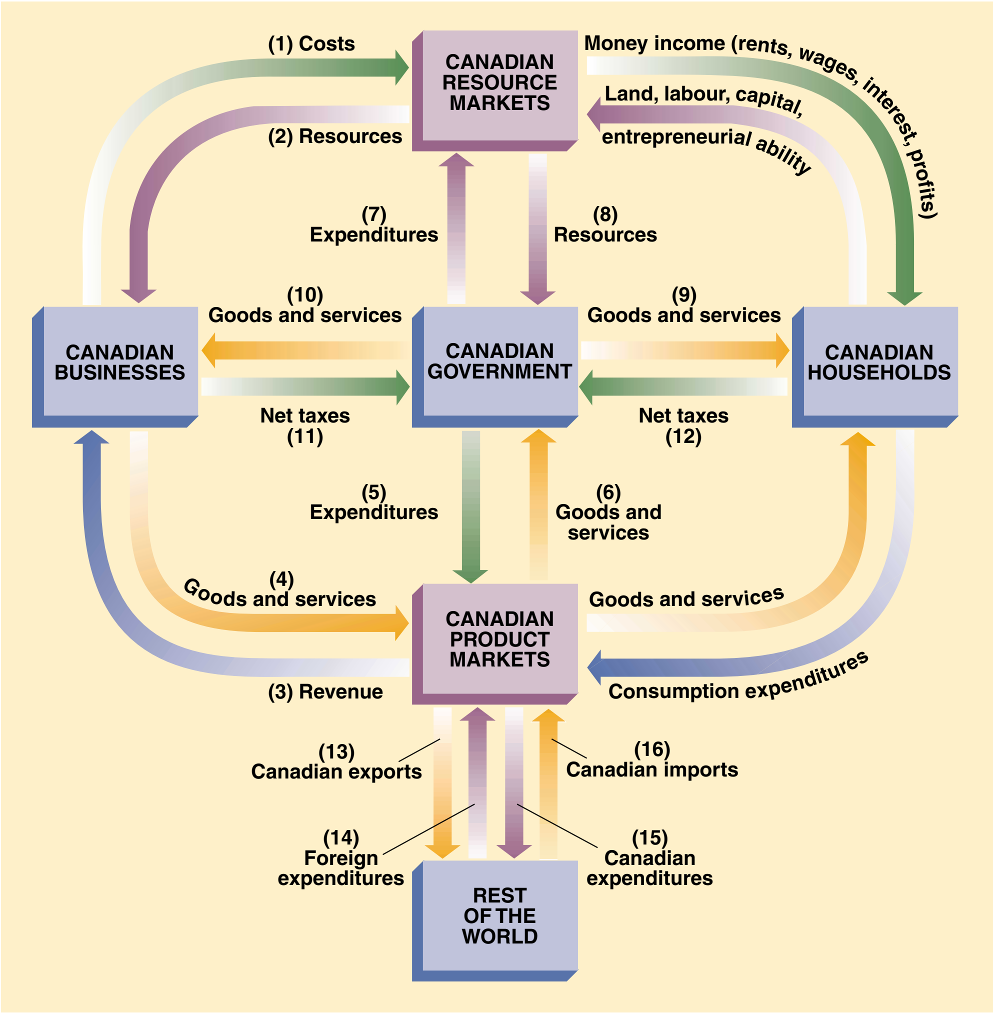
BACK TO THE CIRCULAR FLOW MODEL

a as ly a r s o orl o a r 's r lar o o l. o so r - a o a s s.

1. r r o s so r ar s a ro ar s o o a a-a so r ar s a a a a ro ar s. larly, a o r a a a o s ss s, Go r , a o s ol s s ors.

FIGURE 5-3

Flows 13–16 in the lower portion of the diagram show how the Canadian economy interacts with "The Rest of the World." People abroad buy Canadian exports, contributing to our business revenue and money income. Canadians, in turn, spend part of their incomes to buy imports from abroad. Income from a nation's exports helps pay for its imports.



2. la or s or s o orl so a ra s a a a ro ar s. s s or s a s all or a o s a al a als, s ss s, a o r s a a .

lo (1) r - s o s a o l , s ss s, a o r s a roa y a a a ro s o r or s ro o r ro ar . s oo s a s r s lo o a a a or s o or a o s s a o a y a o os o - ary r o (1) ro r s o orl o s. r s o s o s r s ro a roa , a a a s ss s a or o s r so r s (o 2) o ro- oo s or or y ay or s r so r s r s ro a roa . s, o s o (1) o o y o (r s, a s, r s , a ro s) o a a a o s ol s r s s.

o r or s ar o ly al r . lo (1) s o s a a a a o s ol s, s ss s, a o r s so o r o o or- ro s. s ro s, o o rs , ar o r or s (o 1). r as s o or s, say, a os a l ro , o r o or o a o , r ro s a s or or o s ol s o y a a a or s.

r r lar o o l s a s l a o a as s ro ar s, a o r a a a s o orl r la o s s also r r o - . ally, r ar l a s a a a r so r ar s a r s o orl .

a a a or s a or s o o ly ro s, also r so r s. or a l , or so r o l a or ra lo s. or o r, so a a a r s oos o a ro o a roa , r s s o a al ro o r o s r so r ar or so r ar s o r a o s. or s a , or l as a ass ly la rla . r o o r r o , o y o s r a la or a a r lay rs a a a.

r ar also r a o al o s o la o r. o 200,000 ra s r a a a a y ar. s ra s a a a la l y o la o r r so r s a a a, ra s o r o al o a o . o r a , ra o s o r as la o r s ly r a a a a la o r ar s, r a ra s or so y s o a a a la o r.

a r lar o o l also o s ra s a a a o a orl ra a s o al so r s o s a l y a o l o a a los a o . ss o s a a o a ly o a o s a o a o s. os a s r a s r r ss o . s s o l s, s r- as s o a a a or s all. s ar s l , o s (1) a (1) r - l a or s o sol a a a oo s r s . a a a r s o l r s o y l r ro o a loy , r o o o y o o a a a o s ol s (o 1). ss o a s s as o - r o a r ss o a a a.

r - also l s s o s a or s or al rs r so r allo a o a o s a a a o o y. a or s or, ro or o so oo s (o r or s) a r o o rs (o r or s) a o l o r s . s, a a a la o r a o r r so r s ar s o ar s or s r s a a ay ro or s r s. s or o o r r so r s o a a r a os a l o a o . o as o s s s o r so r s a o o s s o y a o r o al o a s o r s a ar o l loo a so a s rs . (*Key Question 4*)

QUICK REVIEW

- There are four main categories of economic flows linking nations: goods and services flows, capital and labour flows, information and technology flows, and financial flows.
- World trade has increased globally and nationally. In terms of volume, Canada is the world's seventh largest international trader. With exports and imports of about 40 percent of GDP, Canada is more dependent on international trade than most other nations.
- Advances in transportation and communications technology and declines in tariffs have all helped expand world trade.
- North America, Japan, and the Western European nations dominate world trade. Recent new traders are the Asian economies of Singapore, South Korea, Taiwan, and China (including Hong Kong), the Eastern European nations, and the former Soviet states.
- The circular flow model with foreign trade includes flows of exports from our domestic product market, imports to our domestic product market, and the corresponding flows of spending.

SPECIALIZATION AND COMPARATIVE ADVANTAGE

Specialization and Trade

S eciali a ion and in e na ional ade inc ea e he od c i i of a na ion' e o ce and allo fo g ea e o al o han o ld o he i e be o ible. s a s o . a o o o r 200 y ars a o. a o s s al a ra or sa r aso s as als o al a o a a r s l r a r o r- all o a o .

Basic Principle

arly 1 00s r s o o s a ar o a 's a, o s r - a ays or a rso or a o ry o s al a a a r- so or a o s or ro a a o al ra ar r *all* o o a s.

o s ra a l o a ar r a o a ( ) o s also a s ll o s a r. os a a r o s l ss a ro ss o al a r s s o r . lso s os a ar $ 0 r o r o ra o a s ay a r $1 r o r. 's say a ll a a o a 0 o rs o a r o s a r, 0 o rs.

o l a ro ra o o a r o o s or s o l s r a r 's o or y os o a r o s s $1 00 (0 o rs × $ 0 r o ro sa r o). os o r a r s o ly $ 00 (0 o rs × $1 r o r a o a r). s r a o a o a a s as a **absolute advantage** o a o a a . r r la a a a (a o or lo) s a o . *ill ge he ho e ain ed a a lo e co b eciali ing in acco n ing and ing ome of he ea ning f om acco n ing o hi e a ho e ain e .*

ABSOLUTE ADVANTAGE When a region or nation can produce more of good X and good Y with less resources compared to other regions or nations.

larly, o s a r a r s os o o a a o s r s y s al a a s so o s o o r o r ar s o a or s. os a o l a a r o rs o r ar s a r r , l o l a l s as o o rs. o s a r o l sa r $1 0 o o (10 o rs × $1 r o r o sa r) o a o l s a as a o l r o o or $100 (2 o rs × $ 0 r o r

TABLE 5-3 MEXICO'S PRODUCTION POSSIBILITIES TABLE (IN TONNES)

Product	PRODUCTION ALTERNATIVES A	B	C	D	E
Corn	0	20	24	40	60
Soybeans	15	10	9	5	0

TABLE 5-4 CANADA'S PRODUCTION POSSIBILITIES TABLE (IN TONNES)

Product	PRODUCTION ALTERNATIVES R	S	T	U	V
Corn	0	30	33	60	90
Soybeans	30	20	19	10	0

o 's). y s o r ar s a r r , a r lo rs *hi co of geing he a e n e a ed.*

a s r or o r a o s a r s also r or a o s. al a l s a o s o r os o o a oo s a s r s y s r .

Comparative Costs

r s l a l s o s a s al a o s o o ally s ra l a s r s l s or ro o . 's o sal a o o o ra a o s, s a l ar o o ro o oss l s a l or o r a alys s. os roo oss l s or o ro s o a a a a ar as s o a l s - a - . s a l s ass o s a os s. a o ry s a o s a a o o o ro o s r a ar lar r o o r ro . (s ass o s l s o r s ss o o a r al y o o r o l s o s.)

al a o a ra ar ally al or ro a l o o a o s o ara os s o o ro s o a o s r. a ar o ara os s o or a soy a s - o y o ar ro o al r a s a a l -, s a o s o soy a s (1 10) s sa r o ro 20 o s o or (20 0). r or s ly, o os s o o o soy a s (S) o ro o r o s o or (C) a s, $1S \equiv C$. a s ass o s a os s, s o s *com a ai e-co a io* ll o a as o a s o o r ro . s s ro loo a ro o oss l s a , r s a o r or o s o or (2 20) os o o soy a s (10).

larly, a l - , o ar a a a ro o al r a s a r als a a a a os s 10 o s o soy a s (0 20) o o a 0 o s o or (0 0). a s, o s o ara - os ra o or o ro s a a a s 1 ≡ . o ar ro o al r a a r or s s a ra r o s o or (0) o s a r sa r o o o o soya s (20 1).

COMPARATIVE ADVANTAGE When a region or nation can produce a good at a lower domestic opportunity cost compared to a potential trading partner.

o ara os s, or r al r s o ra , o o ro s o a o s ar l arly r . o o s s say a a a a as a o s oara a a a or, s ly, a **comparative advantage** o r o soy a s. a a a s or o o ly r o s o or o o o o soy a s, - o s or o o r o s o or o o o soy a s. r s o o so or y os s, soy a s ar r la ly a r a a a. *A na ion ha a com a a i e ad an age in ome od c hen i can od ce ha od c a a lo e domeic o o ni co han can a o en ial ading a ne .* o, o ras , as a oara a a a or . l o o o or os s o - r o o soy a s a a a, os s o ly o - ar r o o soy a s o. o ara ly s a , or s a r o. s ar s a o a l - .

TABLE 5-5 COMPARATIVE ADVANTAGE EXAMPLE: A SUMMARY

Soybeans	Corn
Mexico: Must give up 4 tonnes of corn to get 1 tonne of soybeans	*Mexico:* Must give up ¼ tonne of soybeans to get 1 tonne of corn
Canada: Must give up 3 tonnes of corn to get 1 tonne of soybeans	*Canada:* Must give up ⅓ tonne of soybeans to get 1 tonne of corn
Comparative advantage: Canada	Comparative advantage: Mexico

a s o s r s o s o ara os s, o a o s s al , a a or o s o ara a a a , a a a a lar r o al o sa o al o r so r s. o r y ll s r s ar r so r s or ly.

Terms of Trade

a a a a s ro o soy a s a or a ra o 1 or . s, a aa s o l s al soy a s o ly y o l o a *mo e han* r o s o or or o o o soy a s y ra o. larly, o a s ro o a ra o or 1 . o o l a a a o s o o os al or o l o o o soy a s or *le han* o r o s o or . os a ro o a o o a o s a r o a a ra o o o o soy a s or r -a -a- al o s o or . s **terms of trade** ar ally al o o o r ss a a o r ro s ra a a o s ro o alo . a a a s a r -a -a- al o s o or y s o o o soy a s o o, l y a o ly r o s o or y s r so r s o s ally ro soy a s o or . a s a o a o o o soy a s a s a a lo r os o r -a -a- al o s o or ro ra a a a, o ar o os o o r o s a s roo o o or s l s.

TERMS OF TRADE The amount of one good or service that must be given up to obtain one unit of another good or service.

Gains from Specialization and Trade

’s o s o a s o al o ro s al a o a ra . os a or s al a o a ra , ro o al r a a la al r a a l - r o al ro s or o o r s. s o s ar s o ol 1 o a l - . a s, a s r rr 2 o s o or a o s o soy a s (a l -) a a a a s r rr o s o or a 1 o s o soy a s (a l -) o all o r al r a s.

TABLE 5-6 SPECIALIZATION ACCORDING TO COMPARATIVE ADVANTAGE AND THE GAINS FROM TRADE (IN TONNES)

Country	(1) Outputs before specialization	(2) Outputs after specialization	(3) Amounts traded	(4) Outputs available after trade	(5) Gains from specialization and trade (4) – (1)
Mexico	24 corn	60 corn	–35 corn	25 corn	1 corn
	9 soybeans	0 soybeans	+10 soybeans	10 soybeans	1 soybeans
Canada	33 corn	0 corn	+35 corn	35 corn	2 corn
	19 soybeans	30 soybeans	–10 soybeans	20 soybeans	1 soybeans

o ass o a o s s al a or o o ara a a a , - o ro 0 o s o or a o soy a s (al r a) a a a a ro- o or a 0 o s o soy a s (al r a). s o s ar r ol 2 o a l - . s o r 1 $^{1}{}_{2}$ r s o ra , ass - o a s o s o or or 10 o s o a a a soy a s. ol o a l - s o s a s a s ra . s a ol , a r ra a s a 2 o s o or a 10 o s o soy a s, l a a- a s a o s o or a 20 o s o soy a s. o ar r o - ro s or s al a o a ra (ol 1), *bo h* a o s o oy or or a or soy a s! ally, o as a o o o or a o o o soy a s. a a a as a o o s o or a o o o soy a s. s a s ar s o ol .

S eciali a ion ba ed on com a a i e ad an age im o e e o ce alloca ion. The ame o al in of o ld e o ce e l in a la ge global o . o a a a a allo- a all r r so r s o or a soy a s r s ly, sa o al s o r so r s a ro or o , a a r so r s ar s or allo a or ly.

o a r 2 a ro s al a o a r a o al ra a a o a o r o ro o o s ra s os y s o s ro o oss - l s a l a r . a l - a s s ss o s o s o s s o . o s ro o oss l s a a o o o r s a o a , a - a r a o 's ro o oss l s r as s . s al a o a ra a a s o o o r s a oy r as o s o . s, s al a o a ra a sa as a r as r so r s or - olo al ro r ss y a or oo s a a la l o a o o y. (***Key Question 5***)

FOREIGN EXCHANGE MARKET

y rs a s ll rs, r als, r s, or a o s, s o y o y ro - s or o ay or s o r so r s. o o y, r s ar s a o s rr y a y rs s a rr y o r as o s ro s. o, or a l , y rs oss ss sos, a ly rr y a s ll rs a . r a o al ar s ar r . o a y ollars o s a o y a r - loa o a or s ll or 000 sos, a G r a a o o l s ll or 0,000 ros, or a a a s o or y l r a 00,000 y ro rs o, G r a y, a a a a ay sos, ros, a y , r s ly, so y a ay r a s, r , r s , s, a a s. **foreign exchange market**, *a ma ke in hich a io na ional c encie a e e changed fo one ano he* , s r s s . - l r r s s ar s ar all **exchange rates** *he a e a hich he c enc of one na ion i e changed fo he c enc of ano he na ion.* (Glo al rs . .) o o s a o or a ar ar ar larly o or y

FOREIGN EXCHANGE MARKET A market in which the money (currency) of one nation can be used to purchase (can be exchanged for) the money of another nation.

EXCHANGE RATE The rate at which the currency of one nation is exchanged for the currency of another nation.

1. **A Competitive Market** al- orl or a ar s o or los ly o ar s s ss a r . y ar o ar s ara r- y lar rs o y rs a s ll rs al s a ar ro s s as a a a ollar, ro a ro, r s o , s ro a, a a a s y .

2. **Linkages to all Domestic and oreign Prices** ar r or a ra o a a o 's rr y s a s al r l s all o s (say, a a a) r s all or (say, a a s or G r a) r s. a ra s a l o s rs o o ry o ra sla r s o or oo s o s o r

GLOBAL PERSPECTIVE 5.3

Exchange rates: foreign currency per Canadian dollar

The amount of foreign currency which a dollar will buy varies greatly from nation to nation. These amounts are for April 2001 and fluctuate in response to supply and demand changes in the foreign exchange market.

$1 Will Buy

1.39 German marks
.44 British pounds
.57 U.S. dollars
5.97 Mexican pesos
1.08 Swiss francs
4.67 French francs
80 Japanese yen
855 South Korean won
1380 Italian lira

o rr y y o ly l ly or ro r y a ra . ollar-y a ra s $.01 (1) r y , a o y l- s o s r a 20,000 ll os a a a a $200 (20,000 × $.01). a ra s $.02 (2 s) r y , ll os a a a a $ 00 (20,000 × $.02). larly, all o r a a s ro s o l o l r o a a a y rs. s yo ll s , a a a ra s as or a l a o s or a a o 's l l o o s ro o a loy .

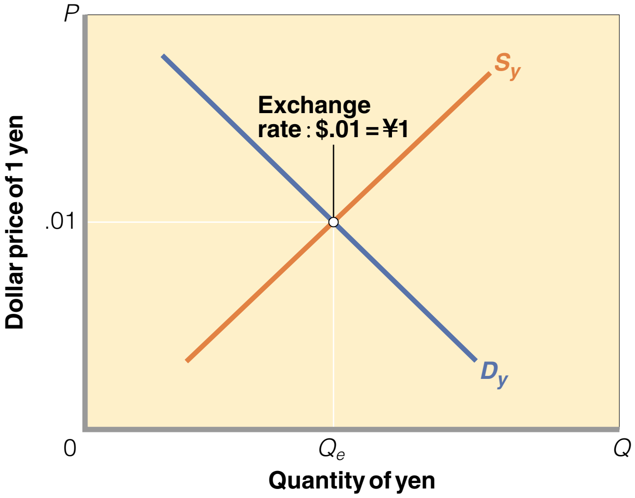
Dollar-Yen Market

o o s or a ar or 's loo r y a ar or ol- lars a y , l a a ls o a la r a r. a a a r s or o a a a ay ollars, o y a a s or rs o a a a oo s oss ss y , o ollars. o a a s or rs ar ll o s ly r y a or ollars or a ar . sa , r ar a a a or rs o a a s oo s o o ay a a s or rs y , o ollars. s a a a s o o or a ar as a rs o y . a a ar r s ollars a ro s y . r - s o s s ly o y (y a a s or rs) a a or y (y a a a or rs). rs o o a r *D* a s ly r *S* s a l s s l r ollar r o y . r l r r o 1 y ollar-y a ra s 1 r y , or $.01 1. s r , ar or y l ars r s r a s or a or a s r l s o y . - l r $.01 r o 1 y a s a $1 ll y 100 y or 100 or o a a - s oo s. o rs ly, 100 y ll y $1 or o a a a oo s.

Changing Rates: Depreciation and Appreciation

a a s a ra o a r a s o a or a s ly o y ar s lar o r a s o a a s ly or al os a y ro . a a a, s ral s r as a or a r - or ollar r o y . o s r s a a a, a l a a a s o y o o ly or o s oo s also or o y l s o s, o a ras,

FIGURE 5-4 THE MARKET FOR YEN



Canadian imports from Japan create a demand D_y for yen, while Canadian exports to Japan create a supply S_y of yen. The dollar price of one yen—the exchange rate—is determined at the intersection of the supply and demand curves. In this case the equilibrium price is $.01, meaning that 1 cent will buy 1 yen.

a ssa a o o l s ro a a . o a a a s o l or y a a or y o l r as . ra a a a a as s a r r r s or a a s oo s. as r s soar 1 0s, a y a a- a a o y rs s r a s ro as- l o s ars o as- a a s o a ars. r s l as a r as a or y . o s a a r as a a a a or a a s oo s ll r as a or y a ra s ollar r o y . os ollar r o y r s s ro $.01 1 o $.02 1. ollar r o y r as s, say a **depreciation** o ollar r la o y as o rr a s or ollars (s s as) o y a s l o or rr y (a y). l r a ly s a , *in e na ional al e of he dolla* as l . r - a ollar ys r y a r or r a a s oo s y a all a a s oo s a o or s o a a a s. s l a a a o - s rs s r r s ro a a s oo s o o l ss s a a- a oo s. or a r s o s r la ly or a ra a o a or o a a a o s rs. o rs ly, a s a y ys or ollars a s, a s r a o al al o y as r as a a a oo s o a r o o l a a a a a a or s o a a r s .

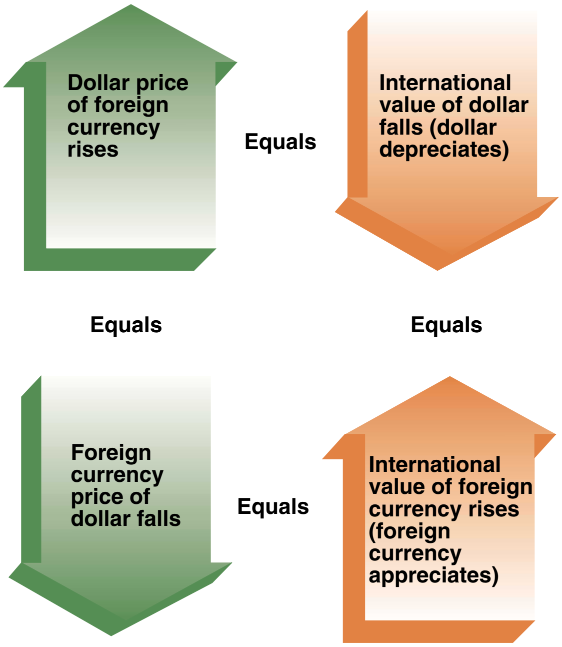
DEPRECIATION (OF THE DOLLAR) A decrease in the value of the dollar relative to another currency so that a dollar buys a smaller amount of the foreign currency.

o os o rr a a s a or a a a oo s y o l s ly or y o ay or s oo s. r as s ly o y r la o a or y o l r as l r r o y or a ar . or a l , ollar r o y l ro $.01 1 o $.00 1. r as ollar r o y s all a **appreciation** o ollar r la o y . a s a r a o al al o ollar as r as . a s r ollars (or s) o y a s l y ollar s or or a s a r as or y a r or or a a s oo s. a o y al a o s l ss s r s o ollars, so a a a s r as or o . ral, a a a or s r s . a l , a s a s or y o a ollar, a a a or s o a a all. r - s ar s s rr y r la o s s. (*Key Question 7*)

APPRECIATION (OF THE DOLLAR) An increase in the value of the dollar relative to the currency of another nation so that a dollar buys a larger amount of the foreign currency.

FIGURE 5-5 CURRENCY APPRECIATION AND DEPRECIATION

Suppose the dollar price of a certain foreign currency rises (as illustrated by the upper left arrow). That means the international value of the dollar depreciates (upper right arrow). It also means that the foreign currency price of the dollar has declined (lower left arrow) and that the international value of the foreign currency has appreciated (lower right arrow).


Dollar price of foreign currency rises
Equals
International value of dollar falls (dollar depreciates)
Equals
Equals
Foreign currency price of dollar falls
Equals
International value of foreign currency rises (foreign currency appreciates)

QUICK REVIEW

- A country has a comparative advantage when it can produce a product at a lower domestic opportunity cost than can a potential trading partner.
- Specialization based on comparative advantage increases the total output available for nations that trade with one another.
- The foreign exchange market is the market in which the currencies of nations are exchanged for each other.
- An appreciation of the dollar is an increase in the international value of the dollar relative to the currency of some other nation; a dollar now buys more units of that currency. A depreciation of the dollar is a decrease in the international value of the dollar relative to another currency; a dollar now buys fewer units of that currency.

GOVERNMENT AND TRADE

o l a a o s ro s al a o a r a o al a , y o o r s so s ry or s r r o o or s or o ra or s a so orl ra arr rs a o r s r ,a y o l y o so

PROTECTIVE TARIFF A tariff designed to shield domestic producers of a good or service from the competition of foreign producers.

Trade Impediments and Subsidies

r ar o r a s y o r s o o ly r r r ra

- **Protective tariffs** ar s a s or s la o or oo s. ro - ar s ar s o s l o s ro rs ro or o -

o . y r ra y a s a r s r s o or oo s, r ys a o ar o s ro s. s a o or s o s, or a l , o l a o s ally ro s o s r la ly l ss s o o s rs.

IMPORT QUOTA A limit imposed by a nation on the quantity (or total value) of a good that may be imported during some period of time.

NON-TARIFF BARRIERS All barriers other than protective tariffs that nations erect to impede international trade.

EXPORT SUBSIDIES Government payments to domestic producers to enable them to reduce the price of a good or service to foreign buyers.

- **Import quotas** ar l s o a s or o al al o s s a ay or . a o a s ll , r r or s o a ro ar o o . or o as ar or a ar s r ar r a- o al o r . a ar , a ro a o o or lar a s a or o a, o r, all or s ar ro o o a s ll .
- **on-tariff barriers** (a , l ly, *non- o a* arr rs) l o ro s l s- r r s, r aso a l s a ar s r a o ro al y, or s ly r a ra r a s o s ro r s. o a o s r r a or rs o or oo s o a l s s a r s r r o l s s ss . l o a y a o s ar lly s or a r l- ral ro s o r ro o o o ally ar l s s, so o r s s l y s o s o or s.
- **Export subsidies** o s s o o r ay s o o s ro rs o or oo s. y r ro o os s, s s s a l ro rs o ar lo r r s a s os ll or or s orl ar s. o a - l s o ro a o r s a a lys s r s s r s, a ro a r a ro s o r al a r ra , o l r s o o a a s . . r o . a a a, a s, a o r a o s a s s o s ar rs o oos o s oo s ly. s s s a lo r ar r o oo , a a ar ally lo r or r s o a r l ral ro .

Why Government Trade Interventions?

a a o s or ls o or s, oos or s, a r a ra s r l s s ro o r ol y r ra s al o a a o y o l a a o a os or o a roa or o s o r a a s as or o r r r ar s ral r aso s so l a , os o .

MISUNDERSTANDING OF THE GAINS FROM TRADE

s a o o ly a y a r a s o r ro r- a o al ra s r a r o s loy or s or. s s s s a or s ar oo a s y r as o s loy , r as or s ar a a s y r o l o o s a o . ally, r r a y r a o al ra s o rall r as o o a ro s al a o a a . a o a lly loy s r so r s, l la o r, or o r a o al ra . r a o al ra , o r, a l s so y o s s r so r s ays a r as s s o al o a r- or s o rall ll- .

a o o s o r a o al ra o o ra *on* s ro o oss l- s r . los (o - ra) a o al o o y a a ll loy o r a o al ra . o r, ro orl ra a o o y a r a a o *be ond* s o s ro o oss l s r . a ro ra s ra o o a ro a roa or s o a or l ss os a y r ro a o .

POLITICAL CONSIDERATIONS

l a a o as a ol a s ro ra , ra ay ar ar lar o s s r s a ar lar ro s o r so r s l rs. o r arl r o ara - a a a a l , s al a o a ra a rs ly a a a a or s ry a a soy a s ry. os s r s s o r s r r o o os o s y rs a r r s o r s o ro ro or s r a s ro ar s or or o as. os o r ly ro or ro o ar r a a s a . s, y a a s ro o rs ol al a y o a r a s. o r, o rall os o ar s a o as y ally r a ly s. s o o o o a os s l $100,000 or or a y ar o ro a o s o a ays l ss a al a a o . or o r, a s s os s ar r r o oo s a s r a o o r ll o s o s, os s or y a al s s all. ol al ar a, o o r la ly ro rs a *o ec ioni m* s lo a o s a , r as o o os oo ll s so or o - s . , l ay o o r y a ar la s l y (or s a r o s loy) a a r o r (y a a a !) o ro o s ar s. all s o ar s ar a a l ar- o l , a rs s y o o s s ar o s r a s- rs o r r o o y. ol al al- a s a o a ar s or a ar l s ry y ro , a 'll a ar s o a o s ry yo r ro o o a a or o ro ar s, or o as, a or s s s.

Costs to Society

ar s a o as o s ro rs o ro ro s, y ar o s o s rs, o s ay r a orl r s or ro oo s. y also r o s r s a s ro oo s as s r ro o ro ss s. or a l , a ar o or s l o l oos r o s l r rs, s r r s a o s r lar l s. lso, ar s a o as r o o ro s r s. l ss o o ro or ro rs, o s r s ay slo o s a l os - sa ro o o s a ro or ro ro s.

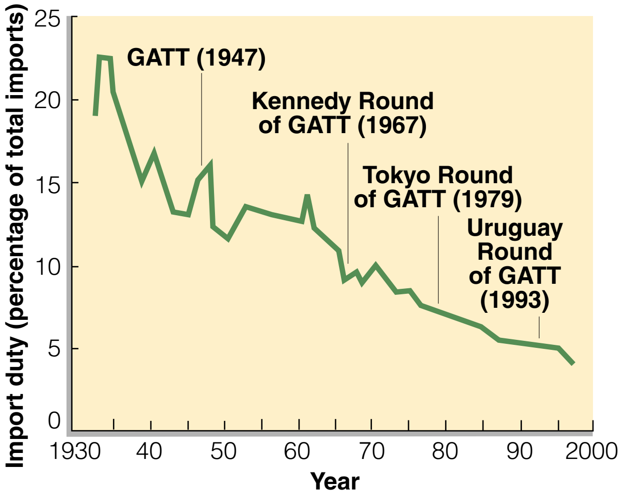
MULTILATERAL TRADE AGREEMENTS AND FREE-TRADE ZONES

o a o a s arr rs a a s or s, a o s os or s s r ay r al a ra arr rs o r o . s a *ade a* , s ala ar s o orl ra a r ryo 's o o ll- . o o s or a s rally a r a ar s r a o r a s o Gr a r ss o . ar o a a , a o s a or o lo r ar s orl . r rs o r ra as a y o r l o s r s ro s or rs o oo s a s r s, or rs o or o o s s o s- ro s, a o s s ll rs o or ro s all s ro ly s or lo r ar s.

r - a s l ar a l a a a as a - ar a o o r o s s ory, a a a ar s a l r as al - ry.

FIGURE 5-6 CANADIAN TARIFF RATES, 1930–2000

Historically, Canadian tariff rates have fluctuated. But beginning with the mid-1930s, the trend has been downward. (Source: Adapted from Statistics Canada, "Historical Statistics of Canada," Catalogue No. 11-516, and Statcan: CANSIM Disc, March 2000.)



Reciprocal Trade Agreements

MOST-FAVOURED-NATION CLAUSE An agreement by Canada to allow some other nation's exports into Canada at the lowest tariff levied by Canada.

s ar r o s o a a a a a a y ar lar a o r ral ro **most-favoured-nation clauses,** o a o a y r ro al ra a r s. s la s s s la a a y s s ly r a a a ar s, r s l ro o a o a y o r a o , o l a ly ally o a y a o a s or al a r . o a a a o a s a r o ar s o r s a s , say, ra , lo r a a a ar o or r a s also a l s o or s o o r a o s a os - a o r - a o s a s, say, a a a rla . s ay, r o s a a a ar s a o a ally a l s o a y a o s.

General Agreement on Tariffs and Trade (GATT)

GENERAL AGREEMENT ON TARIFFS AND TRADE (GATT) The international agreement reached in 1947 in which 23 nations agreed to give equal and nondiscriminatory treatment to the other nations, to reduce tariff rates by multinational negotiations, and to eliminate export quotas.

1 , 2 a o s, l a a a, s **General Agreement on Tariffs and Trade (GATT).** G as as o r r l s (1) al, o - s r a ory ra r a or all r a o s (2) r o o ar s y l la ral o a o a ( ) l a o o or o as. as ally, G ro a or or o a o o r ra arr rs o a l la ral as s a o a o s.

orl ar , r a o s a o l ro s o G o a o s o r ra arr rs. a las ro o o a o s a r ay 1 . r s y ars o ra l , 1 12 r a o s r a a a r . *U g a Ro nd* a r oo o a - ary 1, 1 , a s ro s o s ar o as ro 200 .

r s a r , ar s o o sa s o ro s a l a or r , o rall ar s ally ro y r . a r also l ral o r r l s a as lo al ar or s s r s as a r s , l al s r s, o r s s r s, a a al s r s. o- as o or l s a a ar l r as o a r la ar s.

r ro so sr a r l rals s s a o ar rs a ro l- l al ro r y (a s, ra ar s, o yr s) a a s ra y. lly l , r ay o a r ll oos orl 's G y a s a $ r ll o , or r . o s rs a a a ll sa or a $ ll o a ally.

World Trade Organization (WTO)

WORLD TRADE ORGANIZATION (WTO) An organization established in 1994, replacing GATT, to oversee the provisions of the Uruguay Round and resolve any disputes stemming from it.

r ay o a r s a l s **orld Trade Organization (TO)** as G 's s ssor. o 1 a o s lo o , a las ra . o rs s ra a r s r a y r a o s a r l s o ra s s a o . also ro s or s or r r ro s o ra o a o s.

G a a os or s r o ar l ral orl ra . ra r l s a r o y r a o s ro a s ro a ssary l ar a a s ro o s all or y s al- r s ro s ar o s a o s.

or a r aso a o rs, s ly o ro rs al. r s ar o r a r l s ra o a r a o al ra a s a l r s o r- a o al la s a ro or rs a ro . a oo ar - a la s, or r sa y la s, oll ar a r s, a - ro al la s, r s a as ly s r ro o o a o s a a a r la s or o s rs a y oo s ro os o r s ro o s o r s o a la o r a ro al ro o s s o l rs r ly a o s a a lo s a ar s a a r a o al or a a o s o r a . s ss ss o l o l o ro ss o ra l ral a o , o rs s r a o o s a ross a o s. or o r, say ro o s o , a y ro al a la o r o r s ar r a ly o r lo . os orl ra s a o a a s r al o r s, o a o r s a a lo r ro al a la o r s a - ar s. or o r, r o o oo s a r so r s ras s o a o lo a o s. s or ally, s r as s l s a ar s a - r s ro r, o a r, ro o s or ro a or or rs.

www.wto.org
World Trade Organization

The European Union (EU)

EUROPEAN UNION (EU) An association of European nations that has eliminated tariffs among them, established common tariffs for goods imported from outside the member nations, and allowed the free movement of labour and capital among them.

TRADE BLOC A group of nations that lower or abolish trade barriers among members. Examples include the European Union and the nations of the North American Free Trade Agreement.

o r s a also so o r ar s y r a r o al *f ee- ade one* also all *ade bloc* . os ra a a l s **European Union (EU)**, or- rly all ro a o o o y. a as o o ar 1 , o o r s s 1 s r ro a a o s ra , G r a y, aly, l , rla s, o r , ar , r la , - o , Gr , a , or al, s r a, la , a .

THE EU TRADE BLOC

as a ol s ar s a or o as o arly all ro s ra a o ar a a o s a s a l s a o o sys o ar s a l- a l o all oo s r ro a o s o s . as also l ral o o a al a la o r a as r a o o ol s o r o o a rs o o o r , s as a r l r , ra s or a o , a s ss ra s. s o a s ro **trade bloc** a ro o o r s a o o y, o o r s s, a ra r l s.

ra o as a or ro r as r o als al a o , r a r ro y, r a r o , a as r o o ro . r o o oo s a s r s as r a lar ar s or s r s. r s l o o s o lar -s al ro o a a l o a lo r oss a y o l a a r s all, s l - a o ar s.

s o s ss o o - r a o s, s as a a a, a . a l a r as ly ros ro s a s s rs r s- o rs or a a a or s. a a a r s a o r o - r a o s’ r s a a ar s a o r arr rs a a l or o o a a s r s ra lo . or a l , a os ro G r a y a sol a or ra a o ar s, r as or r a a a a s a os sol os o r s o. s s o - r s a a s r o s sa a a . larly, ra r s r o s a r as r ro a or s o als, l s, a ar ro s, oo s a as r ro a s ro a a .

y r r s o o r s r r - ra o , ra lo s s as o r r rs’ ra o - lo rs. s, orl los s so o s o a o l ly o lo al ra sys . l - a a sa a a as o o o a o s or l ral lo al ra ro orl ra r a a o .

THE EURO

o os s a r a o l s s o s s a l s o so- all ro o . 2002, l o rs ll s ar a o o rr y **euro**. Gr o s l r o ro o o a ary 1, 2002, o sa ay a rr y o s o r la o . Gr a r a , ar , a a o o o o o rr y, a l as or o .

EURO The common currency used by 12 European nations in the Euro zone, which includes all nations of the European Union except Great Britain, Denmark, and Sweden

a ary 1, 1 , ro a s or l ro ay s, s as r ar r as s a ra s r o s a o a s. a ary 1, 2002, ro o s a o s ll r la alo s s rr s, a o ly 1, 2002, o ly ro ll a or ay .

o o s s ro o ra s s a ar o l o ro o rs o r . y o a s o a r- r s, ro ll a r o o oo s, s r s, a r so r s a o ro o rs. ll also a l o s rs a s ss s o o ar - so s o or o s a s, ll r as o o , r r s, a lo r os s.

North American Free Trade Agreement

NORTH AMERICAN FREE TRADE AGREEMENT (NAFTA) A 1993 agreement establishing, over a 15-year period, a free trade zone composed of Canada, Mexico, and the United States.

1 , a a a, o, a a s or a a or ra lo . **The orth American ree Trade Agreement (A TA)** s a l s a r - ra o a as a o sa o o as o ass s a lar r o- ra al ar a. as r a ly r ar s a o r ra arr rs a a a, o, a a s a ll l a r ly y 200 . r s o ar a o l a s a ass loss o a a a o s as r s o o o o a a a a o lo r a s a a r r la o s o oll o a or la sa y. lso, r as o r a a a a o or a o l l la s o a ra s or oo s ar - r o a a a, r- r r a a a r s a or rs.

r ros , r s r oo ss s . loy as r as a a a y or a a ll o or rs s assa o , a loy ra as s ro o r 10 r o r r . r as ra a a a, o, a a s as a s a ar o l all r o r s. (*Key Question 11*)

QUICK REVIEW

- Governments curtail imports and promote exports through protective tariffs, import quotas, non-tariff barriers, and export subsidies.
- The General Agreement on Tariffs and Trade (GATT) established multinational reductions in tariffs and import quotas. The Uruguay Round of GATT (1995) reduced tariffs worldwide, liberalized international trade in services, strengthened protections for intellectual property, and reduced agricultural subsidies.
- The World Trade Organization (WTO)—GATT's successor—rules on trade disputes and provides forums for negotiations on further rounds of trade liberalization.
- The European Union (EU) and the North American Free Trade Agreement (NAFTA) have reduced internal trade barriers among their members by establishing large free-trade zones. Twelve of the 15 EU members now have a common currency—the euro.

INCREASED GLOBAL COMPETITION

r r r a o al ra as ro s o o o a a a a a ross lo . a a a, or s a a a or s ar s o a y ar s, l os or ars, s l, ar r s, lo , s or oo s, l ro s, o or y l s, o oar o ors, a oys. r l ss, r s o a a a r s a ros r lo al ar la . r s as or l a o o r a ar s ar s a o a a ra a ally a r sal s a roa . o rs , o all a a a r s a so s ss l. o a o a l o o r a s r r a o al o ors a r al y ro s or a lo r ro o os s, or o .

s o o a a o a s lo al o o y a oo l o so o s ro rs *do* r a r or rs s loy ls r , or o o l arly s o s rs a so y ral. or s r a o o o oly o r o s r s, r y lo r ro r s a ro o s rs a r a r ar y o oo s. or o o also or s o s ro rs o o or a o ro ro al y a as alr a y a s ral a a a s r s, l s l a a os. os a a a r s a a o o s ss lly lo al ar la .

a a o os a a a r s a a o o s ss lly o ar s ars r al y s a y s o l o o o s ss, l a s ss l or r o . rs s o o loss s a a s ar r so r s ar o s ly. os r so r s o al r a , ro a l s s ll r as o al a a a o . ll ar l ss s or a a a o ro ra a , ssary, r lo a o ass s a o la -o or rs a o ry o ro s o s ro or o o .

The LAST word

SHUFFLING THE DECK

Economist Donald Boudreaux marvels at the way the market system systematically and purposefully arranges the world's tens of billions of individual resources.

In *The Future and Its Enemies*, Virginia Postrel notes the astonishing fact that if you thoroughly shuffle an ordinary deck of 52 playing cards, chances are practically 100 percent that the resulting arrangement of cards has never before existed. *Never.* Every time you shuffle a deck, you produce an arrangement of cards that exists for the first time in history.

The arithmetic works out that way. For a very small number of items, the number of possible arrangements is small. Three items, for example, can be arranged only six different ways. But the number of possible arrangements grows very large very quickly. The number of different ways to arrange five items is 120 . . . for ten items it's 3,628,800 . . . for fifteen items it's 1,307,674,368,000.

The number of different ways to arrange 52 items is 8.066×10^{67}. This is a *big* number. No human can comprehend its enormousness. By way of comparison, the number of possible ways to arrange a mere 20 items is 2,432,902,008,176,640,000—a number larger than the total number of seconds that have elapsed since the beginning of time ten billion years ago—and this number is Lilliputian compared to 8.066×10^{67}.

What's the significance of these facts about numbers? Consider the number of different resources available in the world—my labour, your labour, your land, oil, tungsten, cedar, coffee beans, chickens, rivers, the CN Tower, Windows 2000, the wharves of Halifax, the classrooms at Oxford, the airport at Tokyo, and on and on and on. No one can possibly count all of the different productive resources available for our use. But we can be sure that this number is at least in the tens of billions.

When you reflect on how incomprehensibly large is the number of ways to arrange a deck containing a mere 52 cards, the mind boggles at the number of different ways to arrange all the world's resources.

If our world were random—if resources combined together haphazardly, as if a giant took them all into his hands and tossed them down like so many [cards]—it's a virtual certainty that the resulting combination of resources would be useless. Unless this chance arrangement were quickly rearranged according to some productive logic, nothing worthwhile would be produced. We would all starve to death. Because only a tiny fraction of possible arrangements serves human ends, any arrangement will be useless if it is chosen randomly or with inadequate knowledge of how each and every resource might be productively combined with each other.

And yet, we witness all around us an arrangement of resources that's productive and serves human goals. Today's arrangement of resources might not be perfect, but it is vastly superior to most of the trillions upon trillions of other possible arrangements.

How have we managed to get one of the minuscule number of arrangements that work? The answer is private property—a social institution that encourages mutual accommodation.

Private property eliminates the possibility that resource arrangements will be random, for each resource owner chooses a course of action only if it promises rewards to the owner that exceed the rewards promised by all other available courses.

[The result] is a breathtakingly complex and productive arrangement of countless resources. This arrangement emerged over time (and is still emerging) as the result of billions upon billions of individual, daily, small decisions made by people seeking to better employ their resources and labour in ways that other people find helpful.

Source: Abridged from Donald J. Boudreaux, "Mutual Accommodation," *Ideas on Liberty*, May 2000, pp. 4–5. Reprinted with permission.

CHAPTER SUMMARY

1. Goods and services flows, capital and labour flows, information and technology flows, and financial flows link Canada and other countries.
2. International trade is growing in importance globally and for Canada. World trade is significant to Canada in two respects: (a) Canadian imports and exports as a percentage of domestic output are significant; and (b) Canada is completely dependent on trade for certain commodities and materials that cannot be obtained domestically.
3. Principal Canadian exports include automotive products, machinery and equipment, and grain; major Canadian imports are general machinery and equipment, automobiles, and industrial goods and machinery. Quantitatively, the United States is our most important trading partner.
4. Global trade has been greatly facilitated by (a) improvements in transportation technology, (b) improvements in communications technology, and (c) general declines in tariffs. Although North America, Japan, and the Western European nations dominate the global economy, the total volume of trade has been lifted by the contributions of several new trade participants. They include the Asian economies of Singapore, South Korea, Taiwan, and China (including Hong Kong), the Eastern European countries (such as the Czech Republic, Hungary, and Poland), and the newly independent countries of the former Soviet Union (such as Estonia, Ukraine, and Azerbaijan).
5. Specialization based on comparative advantage enables nations to achieve higher standards of living through trade with other countries. A trading partner should specialize in products and services for which its domestic opportunity costs are lowest. The terms of trade must be such that both nations can obtain more of some products via trade than they could obtain by producing it at home.
6. The foreign exchange market sets exchange rates between currencies. Each nation's imports create a supply of its own currency and a demand for foreign currencies. The resulting supply-demand equilibrium sets the exchange rate that links the currencies of all nations. Depreciation of a nation's currency reduces its imports and increases its exports; appreciation increases its imports and reduces its exports.
7. Governments influence trade flows through (a) protective tariffs, (b) quotas, (c) non-tariff barriers, and (d) export subsidies. Such impediments to free trade result from misunderstandings about the advantages of free trade and from political considerations. By artificially increasing product prices, trade barriers cost Canadian consumers billions of dollars annually.
8. *Most-favoured-nation* status allows a nation to export goods into Canada at its lowest tariff level, then or at any later time.
9. In 1947 the General Agreement on Tariffs and Trade (GATT) was formed to encourage non-discriminatory treatment for all member nations, to reduce tariffs, and to eliminate import quotas. The Uruguay Round of GATT negotiations (1993) reduced tariffs and quotas, liberalized trade in services, reduced agricultural subsidies, reduced pirating of intellectual property, and phased out quotas on textiles.
10. GATT's successor, the World Trade Organization (WTO), has 135 member nations. It implements WTO agreements, rules on trade disputes between members, and provides forums for continued discussions on trade liberalization.
11. Free-trade zones (trade blocs) liberalize trade within regions but may at the same time impede trade with non-bloc members. Two examples of free-trade agreements are the fifteen-member European Union (EU) and the North American Free Trade Agreement (NAFTA), comprising Canada, Mexico, and the United States. Twelve of the EU nations have agreed to abandon their national currencies for a common currency called the euro.
12. The global economy has created intense foreign competition in many Canadian product markets, but most Canadian firms are able to compete well both at home and globally.

TERMS AND CONCEPTS

absolute advantage, p. 108
appreciation (of the dollar), p. 113
comparative advantage, p. 109
depreciation (of the dollar), p. 113
euro, p. 119
European Union (EU), p. 118
exchange rate, p. 111
export subsidies, p. 115
foreign exchange market, p. 111
General Agreement on Tariffs and Trade (GATT), p. 117
import quota, p. 115
most-favoured-nation clause, p. 117
multinational corporation, p. 104
non-tariff barriers, p. 115
North American Free Trade Agreement (NAFTA), p. 119
protective tariff, p. 114
terms of trade, p. 110
trade bloc, p. 118
World Trade Organization (WTO), p. 118

STUDY QUESTIONS

1. Describe the four major economic flows that link Canada with other nations. Provide a specific example to illustrate each flow. Explain the relationships between the top and bottom flows in Figure 5-1.

2. How important is international trade to the Canadian economy? Who is Canada's most important trade partner? How can persistent trade deficits be financed? "Trade deficits mean we get more merchandise from the rest of the world than we provide them in return. Therefore, trade deficits are economically desirable." Do you agree? Why or why not?

3. What factors account for the rapid growth of world trade since World War II? Who are the major players in international trade today? Who are the "Asian tigers" and how important are they in world trade?

4. **KEY QUESTION** Use the circular flow model (Figure 5-3) to explain how an increase in exports would affect the revenues of domestic firms, the money income of domestic households, and imports from abroad. Use Figure 5-2 to find the amounts (in 2000) of Canada's exports (flow 13) and imports (flow 16) in the circular flow model. What do these amounts imply for flows 14 and 15?

5. **KEY QUESTION** The following are production possibilities tables for South Korea and Canada. Assume that before specialization and trade the optimal product mix for South Korea is alternative B and for Canada alternative D.

PRODUCT	SOUTH KOREA'S PRODUCTION ALTERNATIVES					
	A	B	C	D	E	F
Radios (in thousands)	30	24	18	12	6	0
Chemicals (in tonnes)	0	6	12	18	24	30

PRODUCT	CANADA'S PRODUCTION ALTERNATIVES					
	A	B	C	D	E	F
Radios (in thousands)	10	8	6	4	2	0
Chemicals (in tonnes)	0	4	8	12	16	20

   a. Are comparative-cost conditions such that the two areas should specialize? If so, what product should each produce?
   b. What is the total gain in radio and chemical output that results from this specialization?
   c. What are the limits of the terms of trade? Suppose actual terms of trade are 1 unit of radios for 1½ units of chemicals and that 4 units of radios are exchanged for 6 units of chemicals. What are the gains from specialization and trade for each area?
   d. Can you conclude from this illustration that specialization according to comparative advantage results in more efficient use of world resources? Explain.

6. Suppose that the comparative-cost ratios of two products—baby formula and tuna fish—

are as follows in the hypothetical nations of Canswicki and Tunata.

Canswicki: 1 can baby formula ≡ 2 cans tuna fish
Tunata: 1 can baby formula ≡ 4 cans tuna fish

In what product should each nation specialize? Explain why terms of trade of 1 can baby formula = 2½ cans tuna fish would be acceptable to both nations.

7. **KEY QUESTION** True or false? "Canadian exports create a demand for foreign currencies; foreign imports of our goods generate supplies of foreign currencies." Explain. Would a decline in Canadian incomes or a weakening of Canadian preferences for foreign products cause the dollar to depreciate or appreciate? What would be the effects of that depreciation or appreciation on our exports and imports?

8. If the European euro were to decline in value (depreciate) in the foreign exchange market, will it be easier or harder for the French to sell their wine in Canada? If you were planning a trip to Paris, how would the depreciation of the euro change the dollar cost of this trip?

9. True or false? "An increase in the Canadian dollar price of the euro implies that the euro has depreciated in value." Explain.

10. What measures do governments use to promote exports and restrict imports? Who benefits and who loses from protectionist policies? What is the net outcome for society?

11. **KEY QUESTION** Identify and state the significance of each of the following: (a) WTO; (b) EU; (c) euro; and (d) NAFTA. What commonality do they share?

12. Explain: "Free-trade zones such as the EU and NAFTA lead a double life: they can promote free trade among members, but they pose serious trade obstacles for non-members." Do you think the net effects of trade blocs are good or bad for world trade? Why? How do the efforts of the WTO relate to these trade blocs?

13. Speculate as to why some Canadian firms strongly support trade liberalization while other Canadian firms favour protectionism. Speculate as to why some Canadian labour unions strongly support trade liberalization while other Canadian labour unions strongly oppose it.

14. **(The Last Word)** What explains why millions of economic resources tend to get arranged logically and productively rather than haphazardly and unproductivley?

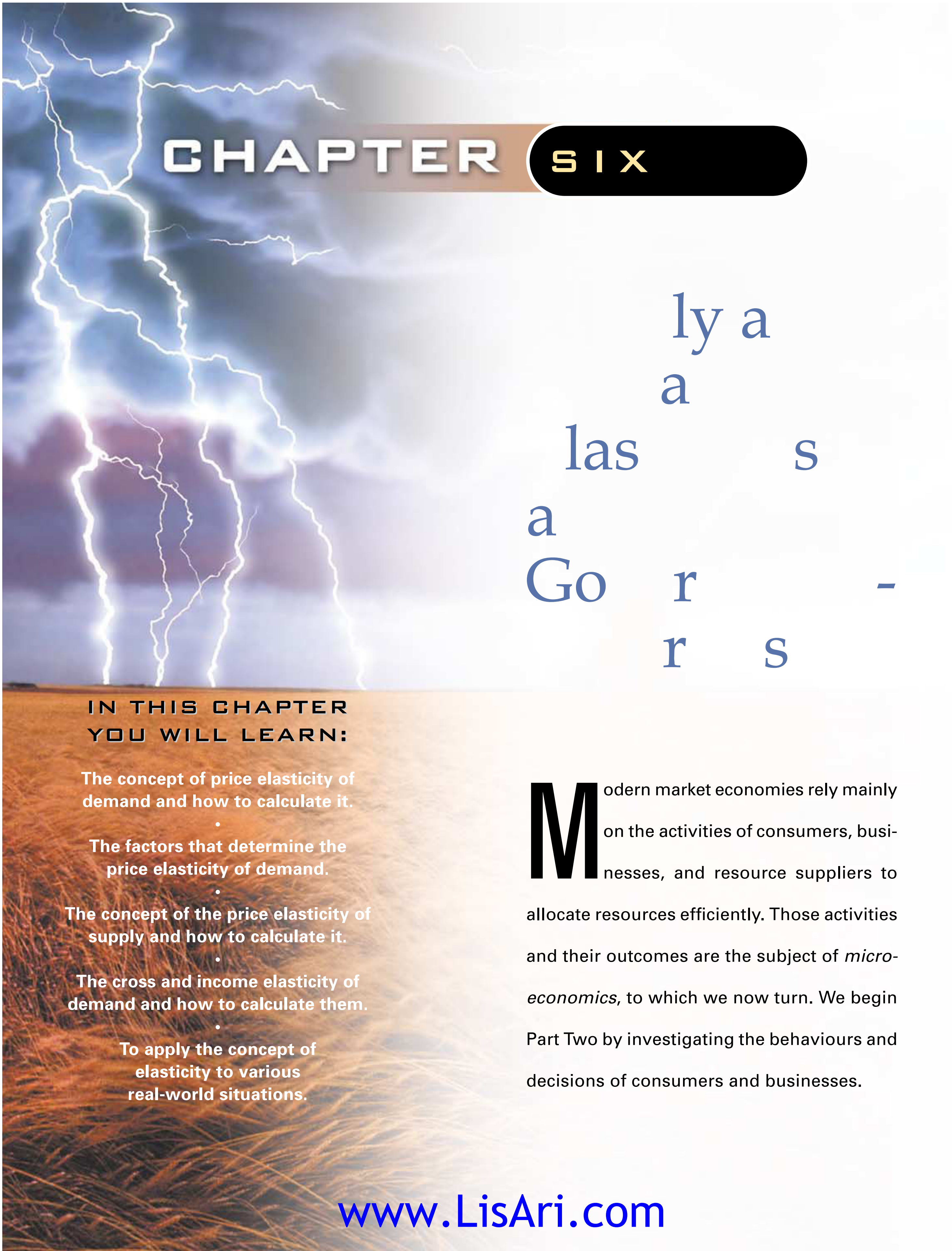
INTERNET APPLICATION QUESTIONS

Σ-STAT

1. **Trade Balances with Partner Countries.** Statistics Canada www.statcan.ca/english/Pgdb/Economy/International/gblec02a.htm sets out Canadian imports and exports to major trading partners and areas for the last five years. Do we have a trading surplus or deficit with the United States? What about with Japan and the European Union?

Σ-STAT

2. **Foreign Exchange Rates—the U.S. for Canadian Dollar.** Statistics Canada provides the exchange rate of the Canadian dollar against the U.S. dollar for the last five years at www.statcan.ca/english/Pgdb/Economy/Economic/econ07.htm. Assume you visited New York City every summer for the last five years and bought a Coney Island hotdog for U.S. $5. Convert this amount to Canadian dollars using the exchange rate for each year and plot the Canadian dollar price of the Coney Island hotdog. Has the Canadian dollar appreciated or depreciated against the U.S. dollar? What was the least amount in Canadian dollars your Coney Island hotdog cost? The most?



CHAPTER SIX

ly a
a
las s
a
Go r -
r s

IN THIS CHAPTER YOU WILL LEARN:

- The concept of price elasticity of demand and how to calculate it.
- The factors that determine the price elasticity of demand.
- The concept of the price elasticity of supply and how to calculate it.
- The cross and income elasticity of demand and how to calculate them.
- To apply the concept of elasticity to various real-world situations.

Modern market economies rely mainly on the activities of consumers, businesses, and resource suppliers to allocate resources efficiently. Those activities and their outcomes are the subject of *microeconomics*, to which we now turn. We begin Part Two by investigating the behaviours and decisions of consumers and businesses.

s a r o r r o s s ss o o a a s ly. rs , ro r as *ice ela ici* , y a s ll r s o s s o o s rs a ro rs o r a *s c o ela ici* , y r s o s o o s rs o o ro r o a o r ro a s a *income ela ici* , y r s o s o o s rs r o s a . o , s ss ar- s o r s s a or r s.

PRICE ELASTICITY OF DEMAND

la o a lls s a o s rs ll y or o a ro s r l s a l ss s r r as s. o or or l ss ll y y a a o ar s ro ro o ro a o r r r ra s or sa ro , a s ar a o s a r. or a l , a r o la a r ll a o o o o s rs ll r s o . y r a ly loyal a o o y, r ’s r a ro ll r s , o s rs ass o o r s ll rs or ro s, r a ro ll l .

PRICE ELASTICITY OF DEMAND The ratio of the percentage change in quantity demanded of a product or resource to the percentage change in its price; a measure of the responsiveness of buyers to a change in the price of a product or resource.

r s o s ss (or s s y) o o s rs o a r a s as r y a ro ’s **price elasticity of demand**. or so ro s or a l , r s a - ra als o s rs ar ly r s o s o r a s. o s r a s a s ry lar a s a y r as . o o s s say a a or s ro s s *ela i el ela ic* or s ly *ela ic*.

or o r ro s or a l , sal o s rs ay l ss a o o r a s. s a al r a s a s o ly s all a s a o r as . a or s ro s s *ela i el inela ic* or s ly *inela ic*.

The Price Elasticity Coefficient and Formula

o o s s as r r o r las y or las y o a o E_d, as

$$E_d \quad \frac{\text{r a a a y a o ro}}{\text{r a a r o ro}}$$

r a a s a o ar al la y *change* a y a y or al a y a a y *change* r y or al r . o a r s a or la as

$$E_d \quad \frac{\text{a a y a o}}{\text{or al a y a o}} \quad \frac{\text{a r o}}{\text{or al r o}}$$

USE OF PERCENTAGES

s r a s ra r a a sol a o s as r o s r r s o - s ss or o r aso s.

rs , s a sol a s, o o s ll ar rar ly a o r r ss o o y r r s o s ss. o ll s ra , r o a a o o or a lo al so all a s r ro $ o $2, a o s rs r as r r- as s ro 0 o 100 a s, a ars a o s rs ar s s o r a s a , r or , a a s las . r all, a r a o o as a s a a o 0 s a o a . y a o - ary ro ollars o s (y o), a a r a o 100 s (s) a s s a a y a o 0 s. s r s l ay als ly l a s

o l a a s las . a o s ro l y s r a
a s. s ar lar r l s r r as r ollars
($1/$) or s (100 / 00).

o , y s r a s, a orr ly o ar o s r r s o s -
ss o a s r s o r ro s. a s l l s s o o ar
s o a y a o a $1 r as r o a $10,000 s ar
a $1 r as r o a $1 so r . r r o s ar
r as y .01 r l r o so r r as y 100 r .
a or s s ly o ar o s r r s o s ss o r r as s y s
so o o r a r as r or o .

<members.tripod.com/ehibbard/micro/elastic.htm>
An overview of elasticities

ELIMINATION OF THE MINUS SIGN

o ro o slo a r s o arl r a rs a r
a a y a ar rs ly r la . s, r las y o
o a E_d ll al ays a a r. s a a l , r l s,
a y a ll r as , a s a ra or o r or-
la ll os a o a or a , y l a a E_d. or a
r as r , o a or ll os ra or ll a-
, a a y l a a E_d.

o o s s s ally or s s a s ly r s a sol al
o las y o o a o a a y a o r s ar s . a
o s o say a a E_d o s r a r a o o 2. s oss l o s o
s a o say a E_d o r als r a r las y a o o 2. o, a
ollo s, or s s o o r las y o a a
s o o ly a sol al . ally, a y o s o ar s s -
ly a s r a a y s l ar os ly r la .

ELASTIC DEMAND
Product or resource demand whose price elasticity is greater than one; the resulting change in quantity demanded is greater than the percentage change in price.

INELASTIC DEMAND
Product or resource demand for which the price elasticity coefficient is less than one; the resulting percentage change in quantity demanded is less than the percentage change in price.

UNIT ELASTICITY
Demand or supply for which the elasticity coefficient is equal to one; the percentage change in the quantity demanded or supplied is equal to the percentage change in price.

Interpretation of E_d

a r r o o r las y o a as ollo s.

ELASTIC DEMAND

a s **elastic** a s r a a r r s l s a lar r
r a a a y a . E_d ll r a r a o . or
a l , s os a a 2 r l r o o rs r s l s a
r r as a y a . a or o rs s las a
E_d .0 / .02 2.

INELASTIC DEMAND

a s r a a r ro s a s all r r a a
a y a , a s **inelastic**. E_d ll l ss a o . or a l , s -
os a a 2 r l r o o l a s o o ly a 1 r r as
a y a . a s las a E_d .01/.02 . .

UNIT ELASTICITY

as s ara las a las a s o rs a r a a
r a r s l r a a a y a ar sa .
or a l , s os a a 2 r ro r o o ola a s s a 2 r-
r as a y a . s s al as s r **unit elasticity**
a s E_d s a ly o , or y. s a l , E_d .02/.02 1.

EXTREME CASES

PERFECTLY INELASTIC DEMAND Product or resource demand in which price can be of any amount at a particular quantity of the product or resource demanded; quantity demanded does not respond to a change in price.

say a s *inela ic,* o o a a o s rs ar o l ly r s o s o a r a . a r s a o , a r a r s l s o a a so r a y a , o o s s say a a s **perfectly inelastic**. r las y o s ro a s r s o r s o s o a a r . ro a a l s l a a ’s a or s l or a a ’s a or ro . l arall l o r al a s, s as D_1 r -1(a), s o s r ly las a ra ally.

o rs ly, say a s *ela ic,* o o a a o s rs ar o l ly r s o s o a r a . a r s a o , a s all r r o a s s y rs o r as r r as s ro ro o all y a o a , las y o s (∞), a o o s s say a s **perfectly elastic**. l arall l o or o al a s, s as D_2 r -1( ), s o s r ly las a . o ll s a r a s a a a l s o a r say, a ras rry ro r a s s ll s ro a r ly o ar .

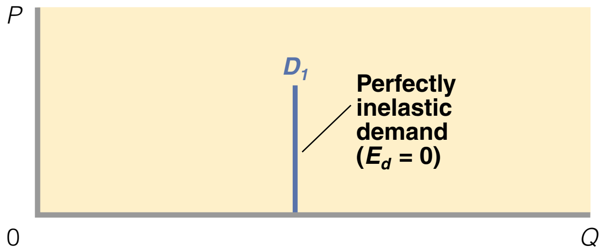
PERFECTLY ELASTIC DEMAND Product or resource demand in which the quantity demanded can be of any amount at a particular product price.

Refinement: Midpoint Formula

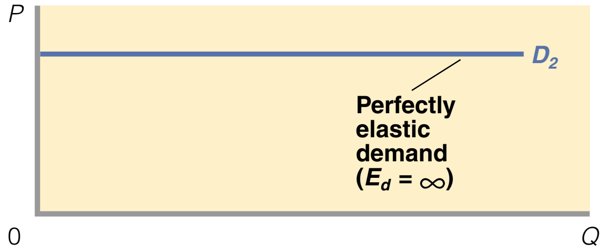
or a ly, a a oy ro l ar s s o r las y o - . o rs a s ro l a s sol o , o s r y o al a a a or o s a l -1. o al la E_d or, say, $ o $ r ra , r a y o a o s o l s as a o o r r a o o s $ - o a o a $ - o a o a o r o ll o o . (s as , a r r s s 1000 - s 2 s s 2000, s s 000, .)

FIGURE 6-1

Demand curve D_1 in panel (a) represents perfectly inelastic demand ($E_d = 0$). A price increase does not change the quantity demanded. Demand curve D_2 in panel (b) represents perfectly elastic demand. A price increase causes quantity demanded to decline from an infinite amount to zero ($E_d = \infty$).



(a) Perfectly inelastic demand



(b) Perfectly elastic demand

TABLE 6-1 PRICE ELASTICITY OF DEMAND FOR MOVIE TICKETS AS MEASURED BY THE ELASTICITY COEFFICIENT AND THE TOTAL-REVENUE TEST

(1) Total quantity demanded per week (thousands)	(2) Price per unit	(3) Elasticity coefficient, E_d	(4) Total revenue (1) × (2)	(5) Total-revenue test
1	$8		$ 8,000	
		5.00		Elastic
2	7		14,000	
		2.60		Elastic
3	6		18,000	
		1.57		Elastic
4	5		20,000	
		1.00		Unit elastic
5	4		20,000	
		0.64		Inelastic
6	3		18,000	
		0.38		Inelastic
7	2		14,000	
		0.20		Inelastic
8	1		8,000	

<www.findarticles.com/m0VEY/8_25/61410375/p1/article.jhtml>
An example of why elasticity is crucial in determining price levels

or $ - r r o , r a s ro $ o $, so r-
a r as r s 20 r a y a s ro o r o s,
so r a r as a y s 2 r . s or la,
E_d 2 /20, or 1.2 , a a a s so a las .
or $ - r r o , r a s ro $ o $, a
r a r as r 2 r a y a s ro o o r
s, or a 20 r l a y. las y o s r or 20/2 ,
or 0. 0, a a a or s s sl ly las . s s
y o al a or o s las or las
sol o o s ro l s o s a ra s o o r s a o
a s as r r o . or sa $ o $ r ra , r r r-
s $. 0, a a y r r s . s. r a a r
s o $1/$. 0, or a o 22 r , a r a a a y s
1/ . 0, or also a o 22 r , ro a E_d o 1. s sol o s a s las-
y a o o r l a r ra . a o s a *mid oin fo -*
m la or E_d as

$$E_d \quad \frac{a \quad a \quad y}{s \quad o \quad a \quad s/2} \quad \frac{a \quad r}{s \quad o \quad r \quad s/2}$$

s a a or $ o $ r ra ,

$$E_d \quad \frac{1}{/2} \quad \frac{1}{/2} \quad 1$$

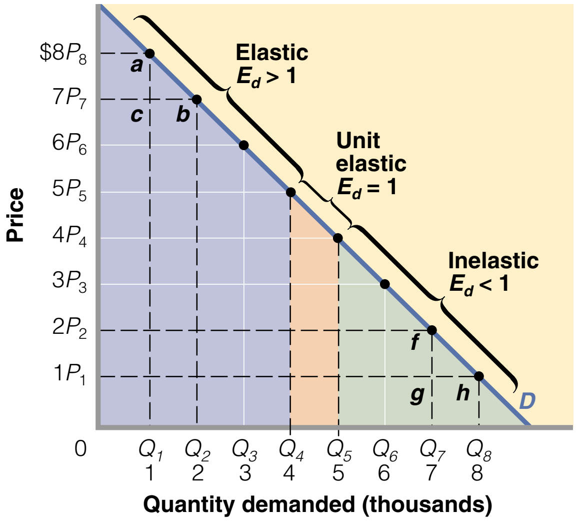
s r s l a s a a r o $. 0 a a . - o , r las -
y o a s y. r a 1 r r a o l r s l a 1 r
a a y a .
s a r s , r y las y o s or $1 o $2 a $ o $
r ra s a l -1. r r a o o E_d or $1 o $2 ra s a a 1 r-
a r ll a a y a y 0.20 r . or $ o $
ra , a 1 r a r ll a a y a y r .

Graphical Analysis

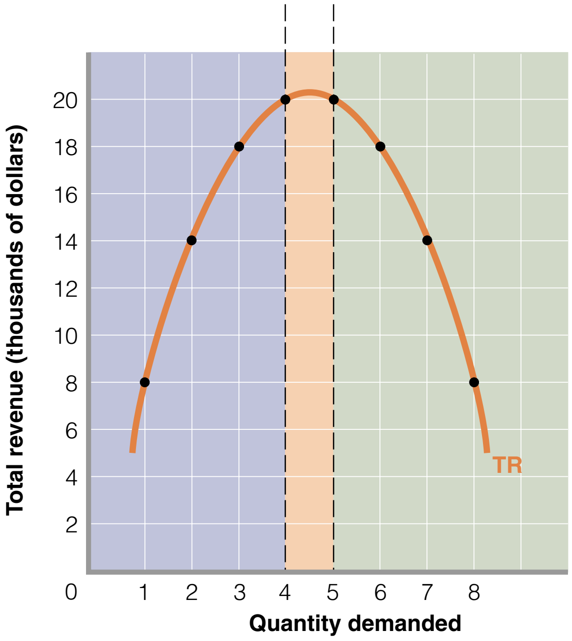
s y o al a a or o s ol s 1 a 2 o a l -1 o lo a r *D* r -2(a). r ll s ra s a las y y - ally ar s o r r r ra s o sa a s l or r . or all s ra -l a os o r a r s, a s or las o ar

FIGURE 6-2 THE RELATION BETWEEN PRICE ELASTICITY OF DEMAND FOR MOVIE TICKETS AND TOTAL REVENUE

Demand curve *D* in panel (a) is based on Table 6-1 and is marked to show that the hypothetical weekly demand for movie tickets is elastic at higher price ranges and inelastic at lower price ranges. The total-revenue curve TR in panel (b) is derived from demand curve *D*. When price falls and TR increases, demand is elastic; when price falls and TR is unchanged, demand is unit elastic; when price falls and TR declines, demand is inelastic.



(a) Demand curve



(b) Total-revenue curve

r l ($ o $ r ra o *D*) a o ar lo r r ($ o $1 r ra o *D*).

s r s o s o ar ro r s o las y as- r . ally, r l s o a r , r a a a y s lar a s or al r r a y s s all. larly, r a a r s s all a s a s or al r r- r s lar . r la ly lar r a a a y y r la ly s all a r y l s a lar E_d a las a . r rs ol s r or lo r r s o a r . r r a a a y s s all a s or al r r a y s lar s larly, r a a r s lar a s or al r r r s s all. r la ly s all r a a a y y r l- a ly lar r a a r r s l s a s all E_d a las a . a r r -2(a) also ll s ra s a slo o a a r s a ss or s ss s o a so as s or las y. a s a slo o r s o ro *ab ol e* a s r a a y, l las y ol s *ela i e* or *e cen age* a s r a a - y. a r r -2(a) s l ar, y o a s a slo s o s a ro o , a o s ra a s a r s las s - r ($ o $) ra a las s lo - r ($ o $1) ra . (***Key Question*** 2)

TOTAL REVENUE (TR) The total number of dollars received by a firm from the sale of a product; equal to the total expenditures for the product produced by the firm and equal to the quantity sold (demanded) multiplied by the price at which it is sold.

QUICK REVIEW

- Price elasticity of demand measures the sensitivity of consumers to changes in the price of a product.
- The price elasticity of demand coefficient E_d is the ratio of the percentage change in quantity demanded to the percentage change in price. The averages of the prices and quantities are used as references in calculating the percentage changes.
- When E_d is greater than one, demand is elastic; when E_d is less than one, demand is inelastic; when E_d is equal to one, demand is unit elastic.
- Demand is typically elastic in the high-price (low-quantity) range of the demand curve and inelastic in the low-price (high-quantity) range of the curve.

TOTAL-REVENUE TEST A test to determine elasticity of demand between any two prices: Demand is elastic if total revenue moves in the opposite direction as price; it is inelastic when it moves in the same direction as price; and it is unit elastic when it does not change when price changes.

The Total-Revenue Test

or a o las y or r s r la s o o r a s o o al r a s o ro s (o al r s o al os s).

Total revenue (TR) s o al a o s ll r r s ro sal o a ro - a ar lar r o s al la y l ly ro r (*P*) y a y a a sol (*Q*). a o or , *P* × *Q*. o al r a r las y o a ar r la . , r a s as s ay o r r a s las or las s o loy **total-revenue test**, loo s a a a s o o al r ro r a s.

ELASTIC DEMAND

a s las , a r as r ll r as o al r . o a l ss r r s r r , o a o al s ar sol o or a o - sa or lo r r . or a a l , loo a a r *D* r -2(a), s ally las - a r o a r l . (sr ar r -2( ) or o .) o *a* o r , r s $ a a y a s 1 , or 1000 s. o o al r , or r s a y, s $ 000 ($ × 1000 s). r o o s l s o $ (o *b*), a y a o s 2 s, a o al r s $1 ,000 ($2 × 000 s). s a r s l o r l ro $ o $, o al r as r as ro $ 000 o $1 ,000. s r as as o rr a s loss r ro lo r r r s l ss a a r ro lar r a y a a lo r r . ally, $1 r r o a l s o or al 1000 s (Q_1), or a loss o $1000, lo r r r as s a y a y 1000 s (Q_1 o Q_2), a r s l a r o $ 000. s, o a r a s a r as o al r o $ 000 ($ 000 $1000).

r aso s r rs l a s las , a r r as ll r o al r . s ro *b* o *a* o a r , a o al r a s y r r s l ss a loss r ro ro sal s. o s r s l s lls s a a s las a r a a s s o al r o a o os r o .

INELASTIC DEMAND

a s las , a r r as ll r o al r . o s r as sal s ll o o s l r r , a r s l s a o al r ll l . o s s, loo o ar lo r r o a r *D* r -2(a), s ally las - a r o . o *f* o r , r s $2 a a y a s 000 s. o o al r s $1 ,000. r ro s o $1 (o *h*), a y a r as s o 000 - s. o al r o s $ 000, s l arly l ss a $1 ,000. o al r as l a s loss o r ro lo r r s lar r a a r ro a o a y r as sal s. $1 l r a l s o 000 s, a o s r loss o $ 000. sal s r as a o a y a lo r r s 1000 s, r s l s a r a o $1000. o rall r s l s a r as o al r o $ 000 ($1000 $ 000). a , o r a alys s s r rs l a s las , a r r as ll r as o al r . o r, s r s l s ll s a a s las a r a a s s o al r o a sa r o .

UNIT ELASTICITY

s al as o las y, a r as or a r as r l a s o al r a . loss r ro a lo r r s a ly o s y a r ro a o a y r as sal s. o rs ly, a r ro a r r s a ly o s y r loss asso a a o a y l a o a .

r -2(a) a a $ r , 000 s ll sol , y l o al r o $20,000. $, 000 s ll sol , a a r s l $20,000 o o al r . $1 r r o a s s loss o $ 000 r o 000 - s a o l a sol or $ a . s loss s a ly o s y a $ 000 r - a r s l ro sal o 1000 or s a lo r $ r .

Price Elasticity and the Total-Revenue Curve

r -2( ) ra o al r r o a r o r a orr s o s o a r a y o a o a alo a r *D* r -2(a). r a y a o a o r r s y o *a* o a r y l s o al r o $ 000 ($ × 1000 s). r - 2( ), ra s$ a o r ally a o (1000 s) a . - larly, r a y a o a o r r s y o *b* r a l y l s o al r o $1 ,000 ($ × 2000 s). s a o s ra r ally a o s (2000 s) a lo r a l. l - a r s l o s ra s o al-r r a rs slo s ar , r a s a a , a ally r s o ar .

o ar so o r s *D* a s ar ly o s s r la o s las- y a o al r . o r r las ra o a or a l , ro $ o $ r as s o al r . o rs ly, r as r a ra r s o al r . o as s, r a o al r a o os r o s, o r a a s las .

$ o $ r ra o a r *D* r s las y. r r r as s ro $ o $ or r as s ro $ o $, o al r r a s $20,000. o as s, r as a a o al r as r a o s a , o r a a s las o s r s ar lar r a s.

las ra o a r *D*, lo r r or a l , ro $ o $1 r as s o al r , as s o r -2( ). a s r oos s o al r . o as s, r a o al r o sa r o , o - r a a s las .

r a a s o al-r s . o a a s o o al r r o a ro a s. o al r a s o os r o ro r , a s las . o al r a s sa r o as r , a s las . o al r o s o a r a s, a s las .

a l -2 s ar s ara r s s o r las y o a . o s o l r ar lly. (*Key Questions 4 and 5*)

TABLE 6-2 PRICE ELASTICITY OF DEMAND: A SUMMARY

Absolute value of elasticity coefficient	Demand is	Description	Impact on total revenue of a Price increase	Impact on total revenue of a Price decrease
Greater than 1 ($E_d > 1$)	Elastic or relatively elastic	Quantity demanded changes by a larger percentage than does price	Total revenue decreases	Total revenue increases
Equal to 1 ($E_d = 1$)	Unit or unitary elastic	Quantity demanded changes by the same percentage as does price	Total revenue is unchanged	Total revenue is unchanged
Less than 1 ($E_d < 1$)	Inelastic or relatively inelastic	Quantity demanded changes by a smaller percentage than does price	Total revenue increases	Total revenue decreases

Determinants of Price Elasticity of Demand

a o say s a ll r r las y o a a - al s a o . o r, ollo ral a o s ar o l l.

SUBSTITUTABILITY

G rally, *he la ge he n mbe of b i e good ha a e a ailable, he g ea e he ice ela ici of demand.* ll s la r a a r ly o ar , r y o a y r s s s s or ro o a y s s ll r, a r s y a s l s ll r s r ly las . o o s ll r o arro s or o a o s ra s s s r , y rs ll r o r a ly a a la l r- s s s ro y s a y r als. larly, o l lo r- o orl ra arr rs o r as las y o a or os ro s y a or s s s a a la l . or ra , r s a s o s s s or o s a lla s a ol s. o r r , sa arl r a a ’s a or s l s ly las- a s o los s s s s .

las y o a or a ro s o o arro ly ro s . a or o s a rs s or las a s o rall a or s o s. a y o r ra s ar r a ly s s a l or o s a rs, r ar , a y, oo s s s or s o s.

PROPORTION OF INCOME

r s al, *he highe he ice of a good ela i e o con me ’ income , he g ea e he ice ela ici of demand.* 10 r r as r o r la ly lo - r ls or a o s o a s, a a y a ll ro a ly l o ly sl ly. s, r las y or s lo - r s s o lo . a 10 r r as r o r la ly - r a o o l s or o s a s a o al r s o r a s $ 000 or $ 0,000, r s ly. s r r as s ar s a ra o s o a al o s a s o os a l s, a a s a ll l ly - s s a ly. r las y or s s s o .

LUXURIES VERSUS NECESSITIES

ral, *he mo e ha a good i con ide ed a l a he han a nece i , he g ea e i he ice ela ici of demand.* r a a l r y ar rally r ar as s- s s s l o alo o . r r as ll o s a ly r a o o r a o s or a o o l a o r s a o s ol . (o ry lo r las y o o s oo s a l - .) a r a l , a rso o s o l a o ra o or a a s a s s r o as o a ay o ra- ll.

o r, ra l a a o s a ll ry ar l r s, , y o , a as ly or o . r s o ra l a a o s or ll ry r s , a o s r o y a ll s r o r a r ar s o .

a a o a or a o o ro l sal s ly las o r o s oo s s s ar a a la l , sal s a l l a - ly , a sal s a ss y ra r a a l ry.

TIME

G rally, *od c demand i mo e ela ic he longe he e iod nde con ide a ion.* o - s rs o o a s o a s r s. or a l , r

TABLE 6-3 SELECTED PRICE ELASTICITIES OF DEMAND*

Product or service	Coefficient of price elasticity of demand, E_d	Product or service	Coefficient of price elasticity of demand, E_d
Newspapers	.10	Milk	.63
Electricity (household)	.13	Household appliances	.63
Bread	.15	Movies	.87
Major league baseball tickets	.23	Beer	.90
Telephone service	.26	Shoes	.91
Sugar	.30	Motor vehicles	1.14
Eggs	.32	Beef	1.27
Legal services	.37	China, glassware, tableware	1.54
Automobile repair	.40	Restaurant meals	2.27
Clothing	.49	Lamb and mutton	2.65
Gasoline	.60		

* o l ro ro s s s a so r s r or r las y o a .

o a ro r s s, a s o a r o r ro s o s r y ar a a l . o s rs ay o a ly r r r- as s ry r o r s s y 10 r , y ay s o or s .

o r o s ra o s ro ra l y. s s o a s or -r a or asol s or las (E_d .2) a s lo -r a (E_d .). s or r , o l ar s r r s ars a r s, r s asol r s, y ll ally r la s all r, or l- l s.

a l - s o s s a r las y o s or s ral ro s. a o r s so o a o o las y r a s s s ss . s a r s , s l o or r o a la o y r la o r- a s. (*Key Question 6*)

QUICK REVIEW

- When the price of a good changes, total revenue will change in the opposite direction if demand for the good is price elastic, in the same direction if demand is price inelastic, and not at all if demand is unit elastic.
- Price elasticity of demand is greater (1) the larger the number of substitutes available, (2) the higher the price of a product relative to one's budget, (3) the greater the extent to which the product is a luxury, and (4) the longer the period involved.

Applications of Price Elasticity of Demand

o o r las y o a as r a ra al s a , as ol- lo a l s s s .

LARGE CROP YIELDS

a or os ar ro s s ly las E_d s r a s .20 or .2 . s a r s l , r as s o o ar ro s ar s ro a oo ro s a- so or ro r as ro y o r ss o r s o ar ro s a o al r s (o s) o ar rs. or ar rs as a ro , las a or r ro a s a a lar ro ay s ra l . or ol y- a rs a s a a oal o r o al ar o r r s a ar o r s r .

SALES TAXES

o r ays a o o las y o a s l s oo s a s r s o o l y sal s a s. a $1 a s l o a ro a 10,000 s ar sol , a r ll $10,000 ($1 × 10,000 s sol). o r - ra s s a o $1. 0 r r r s sal s o 000 a s o las- a , a r ll l o $ 00 ($1. 0 × 000 s sol). a s a r a o a ro las a ll r l ss a r , l sla- r s o s o ro s a a las a s as l or, aso- l , a ar s l y sal s a .

DECRIMINALIZATION OF ILLEGAL DRUGS

<www.drugwarfacts.org/economi.htm> The drug war and economics

r y ars ro osals o l al r s a ly a . ro o s o a r s s o l r a l al o ol y s o l a l al or a l s a r la or r y a o y. rr ar o r s, s ar , as s ss l a asso a os s l lar ol or s, o s r o o or r so s, a o r r o r sys , a ol a os s a r as ar ly. o o a l al a o o l r r ra s a ly y a ro o o . ra o a a ro , or a l , ar a o ro a o l sol a lo r s l al ar s. a s a o a s s ly las , a o s o s a lo r r s o l r as o ly o s ly. s' o al r s or o a a ro o l l a so o l s r r a a s os r s. o s o l al a o say a o rall a or o a a ro s ar or las a ro o s . a o o las a o a s, a o r ar s 's a s r la ly las . s s o- s s s o o as o al s rs or a l rs, o s ar r s r s ar lo o a s a or s s , say, al o ol r s o ar r s ar . s, lo r r s asso a l al a o o ar r s o l r as o s o y a l rs. lso, r o al o l al ro o s a a s s r s a r s or so ally a a l , r as a or o a a ro .

a y o o s s r a l al a o o o a a ro o l r s r r s y o 0 r , o r a o as a . or o a r s y, r l so a s o l r as r o o as o al s rs o ro y r a r o o as o al s rs o o a y r . o al a y o ro a o l r s y a s a 100 r a a y o o a a o l r s y 0 r .[1] a y s a rs - a l rs ally o a s.

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[1] Henry Saffer and Frank Chaloupka, "The Demand for Illegal Drugs," *Economic Inquiry*, July 1999, pp. 401–411.

o rall r s l , say o o s o l al a o , o l r so al os s, oss ly l a r as s r r .

MINIMUM WAGE

a ro s loy rs ro ay or rs l ss a a s o rly a . a a a a ra s ro a lo o $. 0 - o la o $ .00 r s ol a. r s say a s a a , s a o l r ar a , o s loy rs ar alo r o slo la o r a r s o ar lo r a s o la o r a , a s s loy , ar larly a o a or rs. o r, or rs o r a loy a a r r o s a y o r s o l . a o o o los y ly loy a a o o o a y os o r o s o las y o a or a la o r. s ar s s s a a or a la o r s r la ly las . orr , s a s a o a s asso a a o l o loss s. loy ar a y r s o a o l s ro r a or a or rs r las .

PRICE ELASTICITY OF SUPPLY

o o r las y also a l s o s ly. ro rs ar r la ly r s o s o r a s, s ly s las . y ar r la ly s s o r a s, s ly s las .

as r r o r las y or las y o s ly o- E , al os l E_d a s s r a a a y s l or r a a a y a

$$E \quad \frac{\text{r a a a y s l o ro}}{\text{r a a r o ro}}$$

or r aso s la arl r, a ra s, or o s, o or a a r a s s l a or a a r r s ar s as r r o s or r a a s. os a r as r o a oo ro $ o $ r as s a y s l ro 10 s o 1 s. r a a r o l 2/ , or 0 r , a r a a a y o l /12, or r E . /. 0 . . s as , s ly s las , s r las y o s l ss a o . E s r a r a o , s ly s las . s al o o , s ly s las . lso, E s r a , s r a a y s l ar r ly r la . s, r ar o s s s o ro , as as ssary las y o a .

a r a o **price elasticity of supply** s a o o ro- rs a o r s o o a a ro r . r 's r s o s o, say, a r as r o r s as r s s o s a l y o s r so r s ro ro o o o r ro s (os r s ass r a o s a) o ro o o r s. r so r s a s lo r a a la l , r a r a l y o s r so r s. o, a a r a r r s o s , a r-or r a r las y o s ly, lo r a r as o a s o a r a . a aly a o o las y, o o s s s s a o a ar r o , s or r , a lo r .

PRICE ELASTICITY OF SUPPLY The ratio of the percentage change in quantity supplied of a product or resource to the percentage change in its price; the responsiveness of producers to a change in the price of a product or resource.

Price Elasticity of Supply: The Market Period

MARKET PERIOD A period in which producers of a product are unable to change the quantity produced in response to a change in its price.

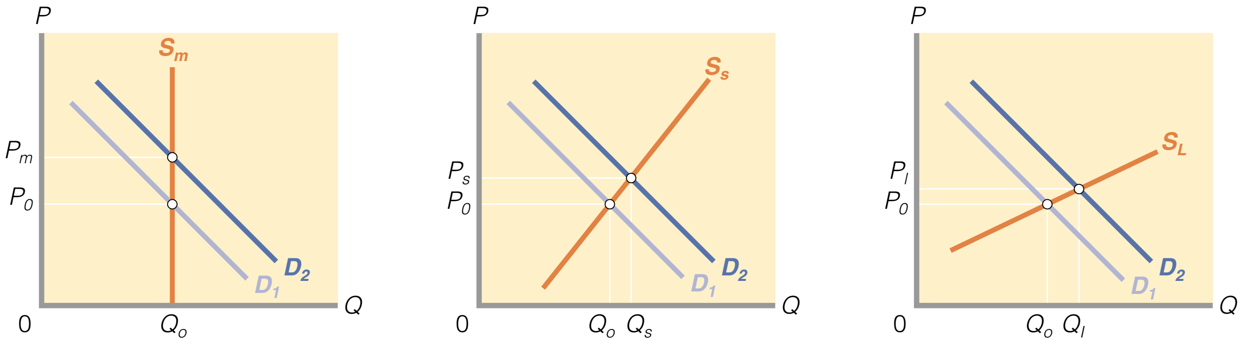
market period s r o a o rs a ly a r a
a ar r s oo s or or ro rs or s o a a a -
y s l . os o r o a s all ar r s o ar o r loa o
o a o s, s r s aso ’s o . s ly r or o a o s s
r ly las (r al) ar r ll s ll r loa r r s
or lo . y a s ar r a o r o ly o r loa o o a o s
r o o a o s s r a a a . ar r l o
o r or o a o s, o a o s a o ro o r . o r ll
ro s aso s or s o o a r- a - r y ro
or a o r loa . larly, a s ro s r s a l , ar r
a o ol ro ar . r s lo r a a a ,
ar r ll s ll s ll r r loa .

ar r’s os s o ro o , ally, ll o r o s s o o
s ll. o r o o a o s ay all ar s or o ro o os s, ar r
ll r l ss s ll o o a o a o al loss ro s o la . r ar
r o , o r ar r’s s ly o o a o s s o ly o r loa s o r o
a r o or lo r .

r - (a) s o s ar r’s r al s ly r r ar r o .
ly s r ly las a s ar r o s o a or s o o a
a a , say ro D_1 o D_2. r s l r r as ro P_0 o P_m s -
ly r s y rs a y s l l s o r as
o .

o r, o all s ly r s r ly las a ly a r a
r a . ro s o r s a l a r r s s, ro rs ay
oos o r as a y s l y ra o r or s o sol ,
s or oo s, a s ar s ly r o a a so os slo . or o r

FIGURE 6-3



(a) Immediate market period **(b) Short run** **(c) Long run**

The greater the amount of time producers have to adjust to a change in demand, here from D_1 to D_2, the greater will be their output response. In the immediate market period in panel (a), producers have insufficient time to change output, and so supply is perfectly inelastic. In the short run in panel (b), plant capacity is fixed, but changing the intensity of its use can alter output; supply is therefore more elastic. In the long run in panel (c), all desired adjustments, including changes in plant capacity, can be made, and supply becomes still more elastic.

o a o ar r, ar r o ay a ll ro s aso or ro rs o oo s a a s ly s or , r ay o ar r o a all.

Price Elasticity of Supply: The Short Run

SHORT RUN A period of time in which producers are able to change the quantities of some but not all of the resources they employ.

short run, la a a y o al ro rs a o r s ry s . so, r s o a o s r la s or or l ss s ly. s or r , o r ar r's la (la a ar a ry) s , s a a la l s or r o l a o a o s or s ly y a ly or la o r a or r l ra s s o ro . r s l s a so a r a r o r s o s o a r s r as a s r a ro s r a or las s ly o o a o s, as s o y r S r - ( ). o o a r as a ro D_1 o D_2 s y a r as a y (ro Q_0 o Q), so r s a s all r r a s (ro P_0 o P) a ar r o . l r r s, r or , lo r s or r a ar r o .

Price Elasticity of Supply: The Long Run

LONG RUN A period of time long enough to enable producers of a product to change the quantities of all the resources they employ.

long run s a r o lo o or r s o a s r la s s a or r s o r (or s r s o l a) s ry. o a o s ry, or a l , o r ar r as o a r a o al la a y or a ry a . r r or , o r ar rs ay, o r , a ra o o a o ar y r as a a r r . a s s r a a lar r s ly r s o s , as r r s y or las s ly r S_L r - ( ). o o s a s all r r r s (P_0 o P_1) a a lar r o r as (Q_0 o Q_1) r s o s o r as a ro D_1 o D_2. (*Key Question 10*) r s o o al-r s or las y o s ly. ly s o s a os or r r la o s r a a o s l s ly r s slo - . ar l ss o r o las y or las y, r a o al r al ays o o r.

CROSS ELASTICITY AND INCOME ELASTICITY OF DEMAND

r las s as r r s o s ss o a y o a ro a or s l s r a s. o s o o a oo also s a y a a r o a r la ro or y a a o .

CROSS ELASTICITY OF DEMAND The ratio of the percentage change in quantity demanded of one good to the percentage change in the price of some other good; a positive coefficient indicates the two products are substitute goods; a negative coefficient indicates they are complementary goods.

Cross Elasticity of Demand

cross elasticity of demand as r s o s s o s r r as s o o ro (say,) ar o a a r o so o r ro (say,). al- la o o ross las y o a E s as o o o s l r las y, a r la r a a o s - o o o r a a r o

$$E = \frac{\text{r a a a y a o ro}}{\text{r a a r o ro}}$$

s ross las y (or ross r las y) o allo s s o a y a or lly rs a s s a o l ary oo s, ro a r .

SUBSTITUTE GOODS

ross las y o a s os , a a sal s o o sa r o as a a r o , a ar s s oo s. a - l s o a l ( ) a l ( ). r as r o o a l a s s o s rs o y or l , r s l a os ross las y. lar r os ross las y o , r a r s s a l y o ro s.

COMPLEMENTARY GOODS

ross las y s a , o a a o o r a r as r o o r as s a or o r. y ar o l ary oo s. or a l , a r as r o a ras ll r as a o o l r as . lar r a ross las y o , r a r s o l ar y o oo s.

INDEPENDENT GOODS

ro or ar- ro ross las y s s s a o ro s o s r ar r la or oo s. a l s al s a l o l o a a r o al s o a a y o r as s o l , a rsa.

APPLICATIONS

r o s s a l y o ro s, as r y ross las y o - , s or a o s ss s a o r . or a l , s os a o a- ola s o s r r o lo r r o s r ra . o o ly ll a o o so a o r las y o a or r (ll r r as or r as o al r), ll also r s o r r as sal o r ll o a s o s o ra . o s s ar sal s o o o s ro s (o) o a a r o a o ro s ro s (r) y o ll r as sal s o r a - al sal s o o lo ross las y o l a a o a r ar a s s s or a o r a a lo r r or r o l a l l o o sal s.

Go r also l ly s s a o ross las y o a ass ss- r a ro os r r o lar r s ll s s a ally r o o a ola a r s la s. or a l , ross las y o a s s , a s ro s s s or a o r. o s - ly, o r o l l ly lo a r r o o a s a s o l l ss o o . o ras , ross las y l a asol s lo or ro. r r o a a ro- a a a o l a a al o o o , so o r o l l a r r a .

INCOME ELASTICITY OF DEMAND The ratio of the percentage change in the quantity demanded of a good to a percentage change in consumer income; measures the responsiveness of consumer purchases to income changes.

Income Elasticity of Demand

Income elasticity of demand as r s r o o s rs r s o o a a r o y y or or l ss o a ar lar oo . o o o las y o a , E_i, s r or la

$$E_i = \frac{\text{r a a a y a}}{\text{r a a o}}$$

NORMAL GOODS

or os oo s, o las y o E_i s os , a a or o ar a as o s r s . oo s ar all or al or s r or oo s, rs s r a r . al o E_i ar s r a ly a o or al oo s. or a l , o las y o a or a o o l s s a o + .00, l o las y or os ar ro s s o ly a o +.20.

INFERIOR GOODS

a o las y o s a s a r or oo . r a r s, a a , lo - s a s s, s lo , a s a l ar l ly a - a s. o s rs r as r r as s o r or oo s as o s r s .

INSIGHTS

o s o o las y o a ro s s o o o y. or a l , o las y l s o la a s o a o ra o o s r s a a a. a ra , o al o o o y as ro y 2 o r a ally. s o as a , s r s ro ro s or a s o las a a r o s. s, a o- o l s (E_i +), o s (E_i +1.), oo s (E_i +1.), a r s a ra als (E_i +1.) a all r s ro ro o o . a l , s r s ro- ro s or o las y s lo or a a o ro slo ly or o l . or a l , a r l r (E_i +.20) as ro ar or slo ly a as o o y's o al o . o o a as o r o s o l .

s a o r a l , r ss o s o r a o l 's o s l , ro- ry s or s ar r la ly r a s or s s ll l ro . o l o o s s a ally a o r r as s o oo r o s all o las y o a or oo s r la ly lo . y o s s a ally a o r r as s o l ro o las y o s - s r la ly . (*Key Questions 12 and 13*)

a l - ro a sy o s s o ross las y a o las y o s.

TABLE 6-4 CROSS AND INCOME ELASTICITIES OF DEMAND

Value of coefficient	Description	Type of good(s)
Cross elasticity:		
Positive ($E_{wz} > 0$)	Quantity demanded of W changes in same direction as change in price of Z	Substitutes
Negative ($E_{xy} < 0$)	Quantity demanded of X changes in opposite direction from change in price of Y	Complements
Income elasticity:		
Positive ($E_i > 0$)	Quantity demanded of the product changes in same direction as change in income	Normal or superior
Negative ($E_i < 0$)	Quantity demanded of the product changes in opposite direction from change in income	Inferior

ELASTICITY AND TAXES

ly a a a alys s a las y o ar a l r a ly r a r o s oo . ’s s r o r rs a o s a aly al ools a r s a y a las y a a .

Elasticity and Tax Incidence

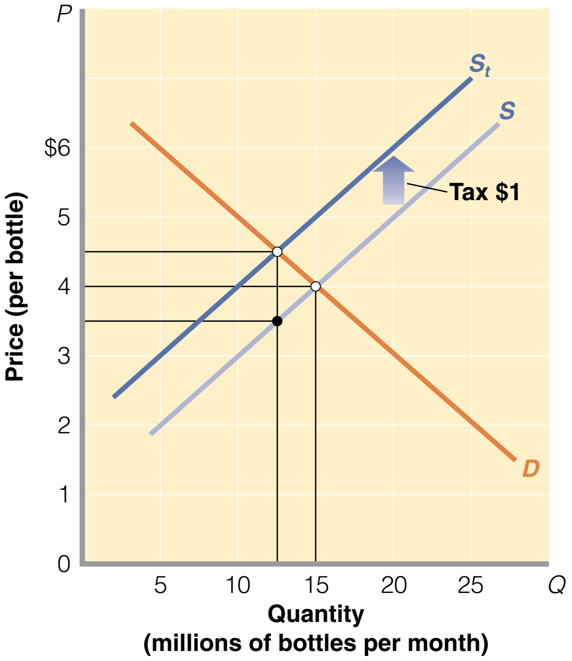
r - , S a D r r s r a ar or a r a o s ro a ara s la. o- a l r r a a y ar $ r o l a 1 ll o o l s. o r l s a a o $1 r o l r ly o -ry or ry o l sol , o a ally ays

DIVISION OF BURDEN

o r la s a o s ll rs (s l rs), a a as a a o o ar al os o ro . o s ll rs s $1 or or a o l or sa r- ro y r or a . l s ll rs ar ll o o r, or a l , ll o o l s o a a $2 r o l , y s o r $ r o l $2 l s $1 a o o r sa ll o o l s. a s s s ly r ar (l ar) as s o r - , r S s a r- a s ly r .

a r- a l r r s $. 0 r o l , r as or - a r as $ .00. o, s as , al $1 a s a y o s rs as a r r o r al s a y ro rs a lo r a r- a r- r . a s, a r ay $1 a r o o r , ro rs r $. 0, or 0

FIGURE 6-4



A tax of a specified amount per unit levied on producers, here $1 per unit, shifts the supply curve upward by the amount of the tax per unit: the vertical distance between *S* and S_t. This shift results in a higher price (here $4.50) to the consumer and a lower after-tax price (here $3.50) to the producer. Thus, consumers and producers share the burden of the tax in some proportion (here equally at $.50 per unit).

l ss a $ .00 or - a r . s s a , o s rs a ro rs s ar r o s a ally ro rs s al a o o s rs a r r a ar o r al s l s.

o also a l r a y r as s as a r s l o a l y a r r os s o o s rs. r - , a l a y s ro 1 ll o o l s r o o 12. ll o o l s r o .

ELASTICITIES

las s o a a s ly r r ro os s o r - , o a o l also r . o ral a o s ar r l a . rs , *i h a eci c l , he mo e inela ic he demand fo he od c , he la ge he o ion of he a hif ed o con me* . o r y s, s ra ally r as s r a s r ly las or r ly las . rs as , o a s r ly o s ll rs s o , a s s r ly o o s rs.

r - o ras s or s al as s r a s r r la ly las-or r la ly las r l a r ra . las a , s o r - (a), a s all or o o a (P_e P_1) s s o o s rs a os o a (P_1 P_2) s or y ro rs. las a , s o r - ( ), os o a (P_i P_1) s s o o s rs a o ly a s all a o (P_1 P_b) s a y ro rs. o ra s r- a s r r s y r al s a *S* a *S*.

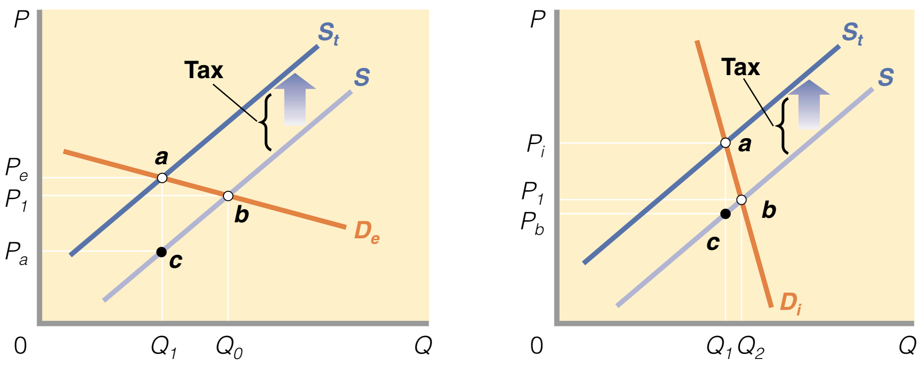
o also a l l r a y (Q_1 Q_2) s s all r a s or las , s as s o o r r o s a l a o s o las-y o -s l sla r s la a y s a s o l or, - ar s, a o o l r s, l o s r , a o r ro s os a s ar o o las . a or s ro s s r la ly las , a o s o r sal s , so a r s ays .

o , *i h a eci c demand, he mo e inela ic he l , he la ge he o ion of he a bo ne b od ce* . s ly s las , as r - (a), os o a (P_e P_1) s s o o s rs, a o ly a s all or o (P_1 P_a) s or y s ll-rs. s ly s las , as r - ( ), r rs s r a or

<economics.about.com/money/economics/library/weekly/aa070897.htm>
Some simple economics of the tobacco deal

FIGURE 6-5

Panel (a): If demand is elastic in the relevant price range, price rises modestly (P_1 to P_e) when a tax is levied. Hence, the producer bears most of the tax burden. Panel (b): If demand is inelastic, the price to the buyer will increase substantially (P_1 to P_i) and most of the tax will be shifted to consumers.

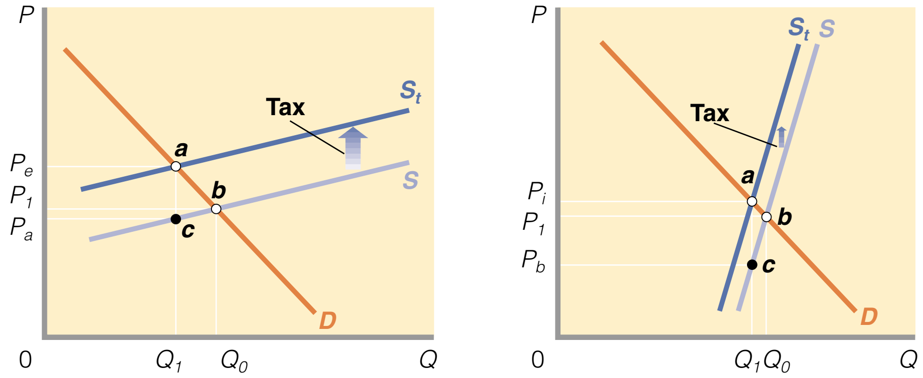


(a) Tax incidence and elastic demand

(b) Tax incidence and inelastic demand

FIGURE 6-6 SUPPLY ELASTICITY AND THE INCIDENCE OF A TAX

Panel (a): With an elastic supply an excise tax results in a large price increase (P_1 to P_e), and the tax is therefore paid mainly by consumers. Panel (b): If supply is inelastic, the price rise is small (P_1 to P_i), and sellers will have to bear most of the tax.



(a) Tax incidence and elastic supply

(b) Tax incidence and inelastic supply

or o o a (P_1 P_b) alls o s ll rs, a a r la ly s all a o (P_i P_1) s s o y rs. l r a y also l s l ss a las s - ly a o s a las s ly.

Gol s a a l o a ro a las s ly, o r r o a a o l a ly all o ro rs. o rs ly, a s s ly o as alls s las , ro rs o l ass o o o s rs o a a o as alls. o ay a o r rs a alys s a ass a o r l s a (sal s) a o o s rs. (*Key Question 14*)

GOVERNMENT-SET PRICES

r o o a o r a or s ly a a o o o r a r l- a o s o o r -s r s. o as o l a o r o- l a s ly a a a r s l r s a ar r a rly o y rs or a rly lo o s ll rs. s s a s o r ay r y l ally l o or lo a r ay o.

Price Ceilings and Shortages

PRICE CEILING A legally established maximum price for a good or service.

price ceiling s a l al r a s ll r ay ar or a ro or s r - . r a or lo l s l al a r a o s o . ra o al or s a l s r l s (or l r s) o s ro s s a y r- or ly a l o s rs o o a so ss al oo or s r a y o l o a or a l r r . a l s ar r o rols a s ry la s, s y a r s or s o r a r s a a ar o orro rs. lso, o r as a s os r l s r o all ro s or o a ry ra o ro s so- all r o rols o ry o r s ra a o . r o rols r o r orl ar a 1 0s.

GRAPHICAL ANALYSIS

a as ly o s ra s o r l s ra ally. ’s s os a ra ly r s orl o oos s r as o a o o l s a s s a or asol o r so a l r or ar r r a s $1.2 r l r , s o as P_0 r - . ra ly r s r o asol r a ly r s lo - o a o ra - o o s ol s o r ss r o r o o so . o asol a or a l or s o s ol s, o r - os s a l r , P_c, o $. r l r . o , a r l s lo l r r . l r o $1. 0, or a l , o l a o a o asol ar .

a ar s o s $. l r ra o a l y o r ar s r r . a s l r , P_c, s lo ar - l ar r , P_0, r s a las s or a o asol . a y o asol a a P_c s Q_d a a y s l s o ly Q a rs s ss a or s or a o a o Q_d Q o rs.

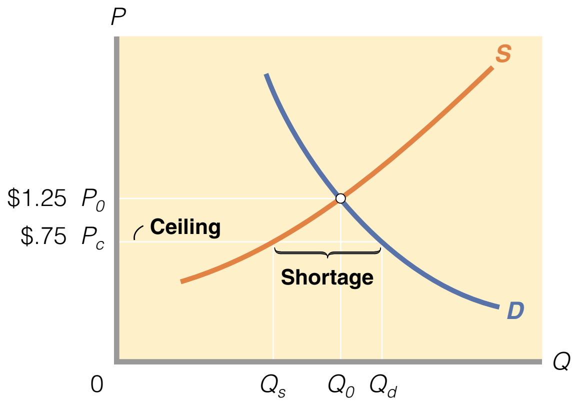
or a o s a r l , P_c, r s s al ar a s - o o a o y rs s r , or ro o a ra o so y rs o o ar . a ro ss o l o l s or a sa ar a l r r a a y, P_0 a Q_0. y r s ar a s s ro o rr , r l os s ro l s or o ar s l r .

RATIONING PROBLEM

o ll o r a or o a a la l s ly, Q , a o y rs o a r a r a o Q_d o l asol s r o a rs - o , rs - s r as s, a s, o os ll a a l o l soo s a o s ay l r s o l as s a o s s r o as s o a o r s a r la s or a o s o l a o a a l s r o o asol , o - r s s a l s so or al sys or ra o o o s rs. o o s o ss ra o o o s, a or ar rs o r as a a o o asol r o . ra o sys o l a l rs r o o o s or Q l r s o asol a a l s r o o o o s a o o s rs so a al y a ly o o r a oor a ly o o r o r sa r o o o s.

FIGURE 6-7

A price ceiling is a maximum legal price, such as P_c, that is below the equilibrium price. It results in a persistent product shortage, here shown by the distance between Q_d and Q_s.



BLACK MARKETS

a o o o s o l o r a s o ro l ro ar s . a r r - lls s a a y y rs ar ll o ay or a l r P_c, a , o o rs , s or ro a l or asol s a o s o s ll a r s a o l . s, s s a l or r a ra y a ll a o - a y r o rols, **black markets** asol s ll ally o a sol a r s a o l al l s ll o rs . o r o ra o o o s ll also a ro l , a s r o asol s o s y o r , r o l ol al r ss r o o r s o s r lo r.

BLACK MARKETS Markets in which products are illegally bought and sold at prices above the legal limits.

RENT CONTROLS

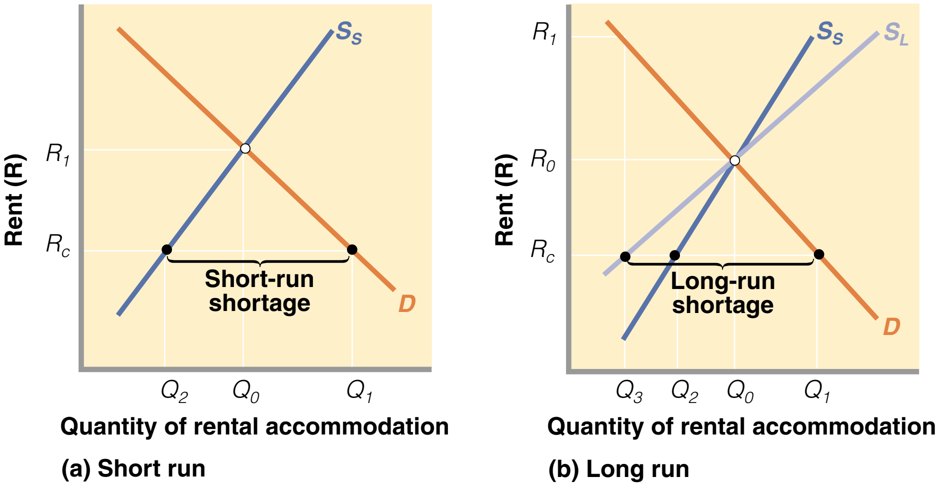
o rols ar a r s s a l s y la (a r ly, r o rols a s a r r as s or s a s). la s ar ll r oals ar o ro lo - o a l s ro s ala r s a s y r- o s s or a s a o a o s or a or a l o oor.

o rols ar rs os , y s ally r s r r as s r s a o r- r l ls. s or -r s ly r or r al a o o a o s las a s a s la lor s so or a o r a s a r s o ar . os a s , s a y o r al a o o a o r- r ly o ar or r o s r o s o s a ly a . s, ro ra a ars o s ss l s or a s o a ar. r - or- rays a ar or r al a o o a o r s a R_c a a s or -r s - ly r , S . s or a Q_1 Q_2 s s s or r .

lo r s or a o r al a o o a o ll ors s s - ly o r al a o o a o o s or las . o s r o o s r as s a la lor s ry o o r s s o o r s s or allo o r ora . s ly r o s or las lo r , s o y S_L r - ( ), a s or a ors , a r as o Q_1 Q . ra ally ors s or a lo r l a s o s ral r la ro - l s. s as o o rols o oo r s, a la ar ll r . la

FIGURE 6-8

In the short run (panel a) the supply for rental accommodation is inelastic. If rent controls are set at R_c, a shortage of $Q_1 - Q_2$ will occur in the short run. In the long run (panel b), supply becomes more elastic as landlords are able to add or withdraw rental units from the market. In the long run the shortage will worsen to $Q_1 - Q_3$. On the black market, rents of as much as R_1 will be charged.



(a) Short run

(b) Long run

ar r al a o o a o s o ara r y ar o y o y. ros a s ar o or o r a la lor or a s l - a o a r a ar lar r al . a a o y o y s ll al os r s o s r o rols, ra s l o s a o a s s o a a a o o ar s. os s ra or r al a o o a o ll a o ay la ar ra o as as R_1, s o r - ( ).

o r ro l a r s l s ro o rols s r o a al r al ar- l s ar ro o rols. ar s os r s ar lo ar l ls ar al os al ays r or ally or so or o y o y a a . s a a r ly o o ar ll o r a r s a o l ls a o l s o o rols as la lor s a o o sa or r r s r o s o r r as s. a s o s r a o y la lor s a a l y o ay y o y, l - lass a s ll as r o s r s o roll ar , l oor ll or o s s o roll ar . r rs ly, a s r o s a a or ar s o ro ra .

o rols s or ar s als a sallo a r so r s. oo r so r s ar allo a o r al o s , oo a y o al r a s s. ro ally, al o r o rols ar o l sla o l ss s o r o s s or a s, o rols ar a r ary a s o s s or a s.

CREDIT CARD INTEREST CEILINGS

r y ars r a a y alls or r s -ra l s o r ar a o s. s al ra o al or r s -ra l s s a a s a r a l s or s ss s ar s ar r s a ly a a r a a a o s rs a , ar- lar, lo r- o s rs y ar r s ra s a a ra a o 1 r . a r s o s s o o r os a lo - l r r s ra o r ar s lo r r s o asso a a l al r s l o l r r ss rs o ar s o r r os s or a r r s

- ar ss rs r s a ar s o r loss s o o - ay a oll o os s. , lo - o o l a yo o l o a o y s a l s r r or ss o l or - l o o a r ar s.
- a al ar o ar ol rs r as , as ar o r a s or ro ss r ar sal s. larly, ar s rs ar a or ry ra sa o .
- ar s rs o a a os - r as ra r o r r ro s r s - r . a r o s or or l a .
- r a a s a a o a y so r ar s (or a l , arra s o ro s o a ar) l a .
- a l s or s a ss r o ar s r as r r s o l o - s l o r s o s o rs o ay as o l s s s o rs o s r ar s.

Price Floors and Surpluses

PRICE FLOORS Legally determined prices above equilibrium prices.

Price floors ar r s y o r . r a or a o r oor s l al a r lo s o . r oors a o l r r s ar s ally o so y l s a r o o ar sys as o ro a s o or r a ro s o r so r s lrs or ro rs. or rly s or r s or a r l ral ro s a rr a s ar o a l s o r (or a) oors. 's loo a or r. os l r r or a s$ r s l a , a s o a lo r , a y ar rs a r ly lo o s. o r s o l y s a l s a l al r oor or r s or o $ r s l.

a ll s a y r a o l r r , a y s l ll a y a a s, r ll a rs s ss s ly or s r l s o ro . ar rs ll ll o ro a o r or sal or a r a y rs ar ll o r as a r oor. s sa a r l , a os l al r sr s ra o a l y o r ar . r - ll s ra s o a r oor. os a *S* a *D* ar s ly a a r s or or . l r r a a y ar P_0 a Q_0, r s ly. o r os s a r oor o P_f, ar rs ll ro Q , r a y rs ll r as o ly Q_d. s r l s s ss o Q o r Q_d. o r a o s r l s r s l ro a r oor o ly o ays

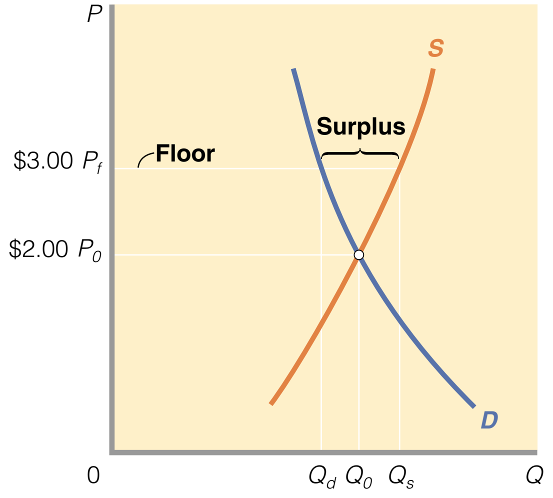
1. a r s r s ly (or a l , y as ar rs o a r o a a r a a o o la o o ro o) or r as a (or a l , y r s ar s s or ro ol). s a o s ay r r l r r a r oor a r y r s o r s l s r l s.
2. o r a r as s r l s o a $ r (r y s s ar rs) a s or or o r s s os o .

Controversial Tradeoffs

a r ar , o or s a s ly s o s o ro rs a a s o s o y rs, r l s a oors r r s a o o . o r s ro a ra o sys o a l ro

FIGURE 6-9

A price floor is a minimum legal price, such as P_f, which results in a persistent product surplus, here shown by the horizontal distance between Q_s and Q_d.



s or a s s ro r l s a s ays o l a ro s r- l s s ar s ro r oors. al a a r s s a l o ro rs al ra o s. all so r l s o o s rs a r oors o ro rs s ala a a s os s asso a o s- s or a s a s r l s s.

r s ss o o r o rols, r o rols, a r s -ra l s o r ar s s o s a o r r r ar a a , s ra l s s. r o rols, or a l , r a ll al la ar s. o rols ay s o ra o s o s r o a r a r. s a o ro - lo - o a l s ro r r s ar s, r s -ra l s ay s - ly y r o os a l s. or all s r aso s, o o s s rally o os o r - os r s.

QUICK REVIEW

- Price elasticity of supply measures the sensitivity of suppliers to changes in the price of a product. The price elasticity of supply coefficient E_s is the ratio of the percentage change in quantity supplied to the percentage change in price. The elasticity of supply varies directly with the amount of time producers have to respond to the price change.
- The cross elasticity of demand coefficient E_{xy} is computed as the percentage change in the quantity demanded of product X divided by the percentage change in the price of product Y. If the cross elasticity coefficient is positive, the two products are substitutes; if it is negative, they are complements.
- The income elasticity coefficient E_i is computed as the percentage change in quantity demanded divided by the percentage change in income. A positive coefficient indicates a normal or superior good. The coefficient is negative for an inferior good.
- Government-controlled prices in the form of ceilings and floors stifle the rationing function of prices and cause unintended side effects.

The LAST word

A MARKET FOR HUMAN ORGANS?

A market might eliminate the present shortage of human organs for transplant. But many serious objections exist to turning human body parts into commodities for purchase and sale.

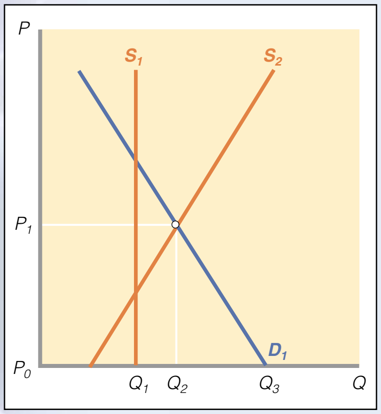
Advances in medical technology make it possible for surgeons to replace some human body parts with donated used parts, much like a mechanic might replace a worn-out alternator in an automobile with one from a junked vehicle. It has become increasingly commonplace in medicine to transplant kidneys, lungs, livers, eye corneas, pancreases, and hearts from deceased individuals to those whose organs have failed or are failing. But surgeons and many of their patients face a growing problem: too few donated organs are available for transplant. Not everyone who needs a transplant can get one. Indeed, an inadequate supply of donated organs causes an estimated 400 Canadian deaths per year.

Why Shortages? Seldom, if ever, do we hear of shortages of used auto parts such as alternators, batteries, transmissions, or water pumps. What is different about organs for transplant?

One difference is that a market exists for used auto parts but not for human organs. To understand this situation, observe the demand curve D_1 and supply curve S_1 in the accompanying figure. The downward slope of the demand curve tells us that if there were a market for human organs, the quantity of organs demanded would be greater at lower prices than at higher prices. Perfectly inelastic supply curve S_1 represents the fixed quantity of human organs now donated via consent before death. Because the price of these donated organs is in effect zero, quantity demanded, Q_3, exceeds quantity supplied, Q_1. The shortage of $Q_3 - Q_1$ is rationed through a waiting list of those in medical need of transplants. Many people die while still on the waiting list.

Use of a Market A market for human organs would increase the incentive to donate organs. Such a market might work like this: An individual might specify in a legal document a willingness to sell one or more usable human organs on death or brain death. The person could specify where the money from the sale would go, for example, to family, a church, an educational institution, or a charity. Firms would then emerge to purchase organs and resell them where needed for profit. Under such a system, the supply curve of usable organs would take on the normal upward slope of typical supply curves. The higher the expected price of an organ, the greater the number of people willing to have their organs sold at death. Suppose that the supply curve is S_2 in the figure. At the equilibrium price P_1, the number of organs made available for transplant (Q_2) would equal the number purchased for transplant (also Q_2). In this generalized case, the shortage of organs would be eliminated and, of particular importance, the number of organs available for transplanting would rise from Q_1 to Q_2. More lives would be saved and enhanced than is the case under the present donor system.

Objections In view of this positive outcome, why is there no such market for human organs? Critics of market-based solutions have two main objections. The first is a moral objection: Critics feel that turning human organs into commodities commercializes human beings and diminishes the special nature of human life. They say there is something unseemly about selling and buying body organs as if they were bushels of wheat or ounces of gold. Moreover, critics note that the market would ration the available organs (as represented by Q_2 in the figure) to people who either can afford them (at P_1) or have health insurance for transplants.



Second, a health cost objection suggests that a market for body organs would greatly increase the cost of health care. Rather than obtaining freely donated (although too few) body organs, patients would have to pay market prices for them, increasing the cost of medical care. As transplant procedures are further perfected, the demand for transplants is expected to increase significantly. Rapid increases in demand relative to supply would boost the prices of human organs and thus further contribute to the problem of escalating health care costs.

Supporters of market-based solutions to organ shortages point out that the market is simply being driven underground. Worldwide, an estimated $1 billion annual illegal market in human organs has emerged. As in other illegal markets, the unscrupulous tend to thrive. Those who support legalization say that it would be greatly preferable to legalize and regulate the market for the laws against selling transplantable human organs.

CHAPTER SUMMARY

1. Price elasticity of demand measures consumer response to price changes. If consumers are relatively sensitive to price changes, demand is elastic. If they are relatively unresponsive to price changes, demand is inelastic.
2. The price elasticity coefficient E_d measures the degree of elasticity or inelasticity of demand. The coefficient is found by the formula

$$E_d = \frac{\text{percentage change in quantity demanded of X}}{\text{percentage change in price of X}}$$

Economists use the averages of prices and quantities under consideration as reference points in determining percentage changes in price and quantity. If E_d is greater than one, demand is elastic. If E_d is less than one, demand is inelastic. Unit elasticity is the special case in which E_d equals one.

3. Perfectly inelastic demand is graphed as a line parallel to the vertical axis; perfectly elastic demand is shown by a line above and parallel to the horizontal axis.
4. Elasticity varies at different price ranges on a demand curve, tending to be elastic in the upper left segment and inelastic in the lower right segment. Elasticity cannot be judged by the steepness or flatness of a demand curve.
5. If total revenue changes in the opposite direction from prices, demand is elastic. If price and total revenue change in the same direction, demand is inelastic. Where demand is of unit elasticity, a change in prices leaves total revenue unchanged.
6. The number of available substitutes, the size of an item's price relative to one's budget, whether the product is a luxury or a necessity, and the time given to adjust are all determinants of elasticity of demand.
7. The elasticity concept also applies to supply. The coefficient of price elasticity of supply is found by the formula

$$E_s = \frac{\text{percentage change in quantity supplied of X}}{\text{percentage change in price of X}}$$

The averages of the price and quantities under consideration are used as reference points for computing percentage changes. Elasticity of supply depends on the ease of shifting resources between alternative uses, which in turn varies directly with the time producers have to adjust to a particular price change.

8. Cross elasticity of demand indicates how sensitive the purchase of one product is to changes in the price of another product. The coefficient of cross elasticity of demand is found by the formula

$$E_{xy} = \frac{\text{percentage change in quantity demanded of X}}{\text{percentage change in price of Y}}$$

Positive cross elasticity of demand identifies substitute goods; negative cross elasticity identifies complementary goods.

9. Income elasticity of demand indicates the responsiveness of consumer purchases to a change in income. The coefficient of income elasticity of demand is found by the formula

$$E_i = \frac{\text{percentage change in quantity demanded of X}}{\text{percentage change in income}}$$

The coefficient is positive for normal goods and negative for inferior goods.

10. Legally fixed prices stifle the rationing function of equilibrium prices. Effective price ceilings result in persistent product shortages, and if an equitable distribution of the product is sought, government must ration the product to consumers. Price floors lead to product surpluses; the government must either purchase these surpluses or eliminate them by imposing restrictions on production or by increasing private demand.

TERMS AND CONCEPTS

price elasticity of demand, p. 127
elastic demand, p. 128
inelastic demand, p. 128
unit elasticity, p. 128
perfectly inelastic demand, p. 129
perfectly elastic demand, p. 129
total revenue (TR), p. 132
total-revenue test, p. 132
price elasticity of supply, p. 138
market period, p. 139
short run, p. 140

long run, p. 140
cross elasticity of demand, p. 140
income elasticity of demand, p. 141
price ceiling, p. 145
black markets, p. 147
price floors, p. 148

STUDY QUESTIONS

1. Explain why the choice between discussing 1, 2, 3, 4, 5, 6, 7, and 8 units or 1000, 2000, 3000, 4000, 5000, 6000, 7000, and 8000 movie tickets makes no difference in determining elasticity in Table 6-1.

2. KEY QUESTION Graph the accompanying demand data and then use the midpoint formula for E_d to determine price elasticity of demand for each of the four possible $1 price changes. What can you conclude about the relationship between the slope of a curve and its elasticity? Explain in a nontechnical way why demand is elastic in the northwest segment of the demand curve and inelastic in the southeast segment.

Product price	Quantity demanded
$5	1
4	2
3	3
2	4
1	5

3. Draw two linear demand curves parallel to one another. Demonstrate that for any specific price change, demand is more elastic on the curve closer to the origin.

4. KEY QUESTION Calculate total-revenue data from the demand schedule in question 2. Graph total revenue below your demand curve. Generalize about the relationship between price elasticity and total revenue.

5. KEY QUESTION How would the following changes in price affect total revenue? That is, would total revenue increase, decline, or remain unchanged?

a. Price falls and demand is inelastic.
b. Price rises and demand is elastic.
c. Price rises and supply is elastic.
d. Price rises and supply is inelastic.
e. Price rises and demand is inelastic.
f. Price falls and demand is elastic.
g. Price falls and demand is unit elastic.

6. KEY QUESTION What are the major determinants of price elasticity of demand? Use those determinants and your own reasoning in judging whether demand for each of the following products is probably elastic or inelastic: (a) bottled water, (b) toothpaste, (c) Crest toothpaste, (d) ketchup, (e) diamond bracelets, (f) Microsoft Windows operating system.

7. What effect would a rule stating that university students must live in university dormitories have on the price elasticity of demand for dormitory space? What impact might this in turn have on room rates?

8. "If the demand for farm products is highly price inelastic, a large crop yield may reduce farm incomes." Evaluate this statement and illustrate it graphically.

9. You are chairperson of a provincial tax commission responsible for establishing a program to raise new revenue through sales taxes. Would elasticity of demand be important to you in determining on which products the taxes should be levied? Explain.

10. KEY QUESTION In November 1998 Vincent van Gogh's self-portrait sold at auction for $71.5 million. Portray this sale in a demand and supply diagram and comment on the elasticity of supply. Comedian George Carlin once mused, "If a painting can be forged well enough to fool some experts, why is the original so valuable?" Provide an answer.

11. Because of a legal settlement over state health care claims, in 1999 the tobacco companies had to raise the average price of a pack of cigarettes from $1.95 to $2.45. The projected decline in cigarette sales was 8 percent. What does this imply about the elasticity of demand for cigarettes? Explain.

12. KEY QUESTION Suppose the cross elasticity of demand for products A and B is +3.6 and for products C and D is –5.4. What can you conclude about how products A and B are related? products C and D?

13. KEY QUESTION The income elasticities of demand for movies, dental services, and clothing have been estimated to be +3.4, +1.0, and +0.5, respectively. Interpret these coefficients. What does it mean if an income elasticity coefficient is negative?

14. KEY QUESTION What is the incidence of a tax when demand is highly inelastic? highly elastic? What effect does the elasticity of supply have on the incidence of a tax?

15. A recent study found that an increase in the price of beer would reduce the amount of marijuana consumed. Is cross elasticity of demand between the two products positive or is it negative? Are these products substitutes, or are they complements? What might be the logic behind this relationship?

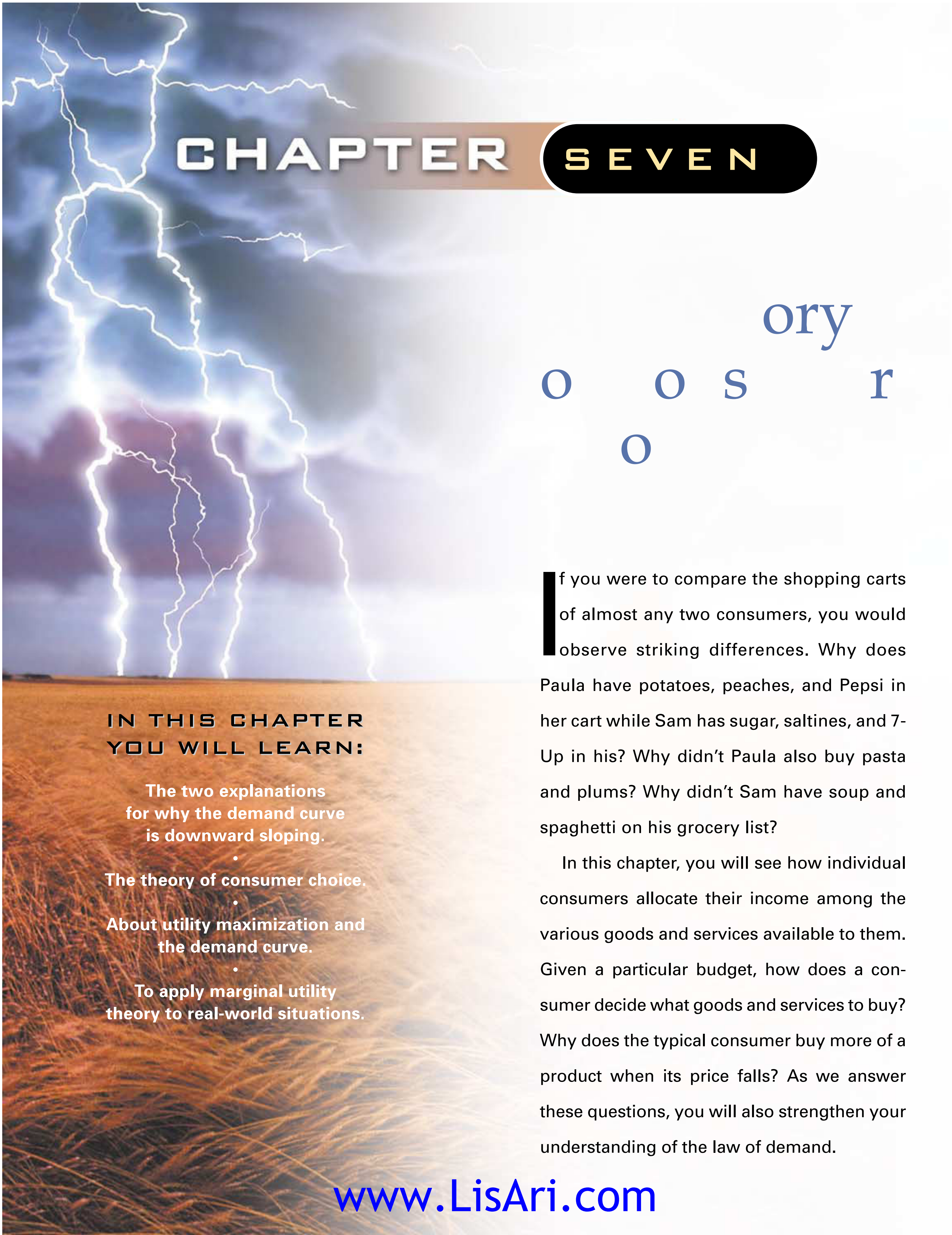
16. Why is it desirable for price ceilings to be accompanied by government rationing? Why is it desirable for price floors to be accompanied by programs that purchase surpluses, restrict output, or increase demand? Show graphically why price ceilings produce shortages and price floors cause surpluses.

17. (The Last Word) Do you favour the establishment of a market for donated human organs? Why or why not?

INTERNET APPLICATION QUESTIONS

1. Generally, the elasticity of demand for a product will be greater (a) the larger the number of substitutes, (b) the greater the proportion of income an item takes, and (c) the less the item is considered to be a necessity. Kmart, <www.kmart.com>, posts a weekly sales circular on selected merchandise, organized by department. It must conclude that the demand for these Blue Light Specials is elastic: the decrease in price will increase total revenue. Check out this week's specials and, for each item, give it one point for meeting the criterion of each determinant above. How many specials score a three? Do any score zero? Why would Kmart include any item that scored less than a three?

2. Rent controls in Ontario began in the 1970s. The Tenant Act was revised in the late 1990s. Visit the Ontario Rental Housing Information Web site at <www.rental-housing.com/canada/ontpage.htm> to see a summary of existing laws. What would be the likely attitude of each of the following groups toward the rent stabilization program: current renters, people looking for an apartment to rent in Ontario?



CHAPTER SEVEN

ory
o o s r
o

IN THIS CHAPTER YOU WILL LEARN:

The two explanations for why the demand curve is downward sloping.

•

The theory of consumer choice.

•

About utility maximization and the demand curve.

•

To apply marginal utility theory to real-world situations.

If you were to compare the shopping carts of almost any two consumers, you would observe striking differences. Why does Paula have potatoes, peaches, and Pepsi in her cart while Sam has sugar, saltines, and 7-Up in his? Why didn't Paula also buy pasta and plums? Why didn't Sam have soup and spaghetti on his grocery list?

In this chapter, you will see how individual consumers allocate their income among the various goods and services available to them. Given a particular budget, how does a consumer decide what goods and services to buy? Why does the typical consumer buy more of a product when its price falls? As we answer these questions, you will also strengthen your understanding of the law of demand.

A CLOSER LOOK AT THE LAW OF DEMAND

la o a s as o o o s s . r s o ra s o s rs ro y a lo r o ra s o y. a r o o la a o s o o ar -slo a r (o a s s o s a la o s ar al l y) a s or s o s r a o . o a o say or a o s la a o s o o o s r a o r, s o s a r. r la a o , as o r r s, s or a a a s s ar a o s a r.

Income and Substitution Effects

r rs la a o o o ar slo o a r ol s o a s s o s.

THE INCOME EFFECT

INCOME EFFECT A change in the quantity demanded of a product that results from the change in real income (purchasing power) produced by a change in the product's price.

SUBSTITUTION EFFECT A change in the quantity demanded of a consumer good that results from a change in its relative expensiveness produced by a change in the product's price, or the effect of a change in the price of a resource on the quantity of the resource employed by a firm, assuming no change in its output.

income effect s a a a a a ro 's r as o a o s r's r al o a , o s ly, o a y o a oo a . 's s os o r ro s a o r s as a la or a o. r o s r s l s, r al o or r as o ro a yo o ys r as s a s, y ar a l o y or sa o al o . r as r al o ll r r as r as s o a y or al oo s, l o r s. or a l , a o s a o y o o $20 ry o s, yo a y 10 o r s a $2 a . r r alls o $1 a a yo y 10 o , yo ll a $10 r l o r o y or o r s a o r oo s. l r o o r s r as s o s rs' r al o , a l o r as or o r s. s r la o s s o .

THE SUBSTITUTION EFFECT

substitution effect s a a a a ro 's r as o s r l- a s ss, a , o s ly, o a y a . r o a ro alls, a ro o s a r r la o all o r ro s. o- s rs ll s s a r ro or o r ro s a ar o r la- ly or s . o r a l , r s o o r ro s r a a a r o o r s alls, la s a a os o or a ra o y r. o r s ar a r la ly r y a $1 a a $2. lo r r ll o s r o s s o r s or so o o r la ly l ss a ra s r a s olas, o l a r, or a. a s a lo r r r as s r la a ra ss o a ro , o- s r ys or o . s r la o s s s s o . o a s s o s o r as a o s r's *abili* a *illingne* o y or o a s oo s r alls.

Law of Diminishing Marginal Utility

Choosing a Little More or Less

s o la a o o o ar -slo a r s a , al o o- s r a s ral ay sa a l , a s or ar lar o o s a sa s . a s s a o o r o s rs' as s r a a , o s rs a as o a ar lar oo or s r as y a a or . , or o a ro y o a , l ss a o al ro y a . o s r ra l oo s, or a l . o s rs' s r s or a a o o l , y a o , ay ry s ro , s r or a s o ar s l ss s , a or a r or o r , a r a a r. l ss y ar oll ors, al s a l s rar ly a or a a al - o ars, al o r o o l allo o r as a ol o l s.

TERMINOLOGY

a s a o s rs a l lls a s s s o a o o y a a a ro s l ss l y a r o s r as . all a a ro as l y a sa s y a a **utility** s a - sa s y o r. l y o a oo or s r s sa s a o or l as r o s ro o s . r ara r s s o s o s as

UTILITY The want-satisfying power of a good or service; the satisfaction or pleasure a consumer obtains from the consumption of a good or service.

1. l y a s l ss ar o sy o y o s. a s y asso ay o r r a l y o ar o o ss rs ar s l ss o ally (o r a or a ra a all).
2. l rs ara r s s a a l y s s . l y o a s ro ay ary ly ro rso o rso . a - r ay a r a l y o so o o r so -roa l l l y o so - o oo ol o l o r . y lass s a r o s l y o so - o o as oor y s o l y a all o a rso 20/20 s o .

. a s l y s s , s l o a y. or r os so ll s- ra o , ass a o l a as r sa s a o s all *il* (s o l y). or a l , a ar lar o s r ay 100 ls o sa - s a o ro a s oo , 10 ls o sa s a o ro a a y ar, a 1 l o sa s a o ro a s o . s a ary s o sa s a o ar o or a y o s r a o r.

<www.leavingcert.net/serve/cont.php3?pg=EC3DAU0493>
A discussion of demand and utility

TOTAL UTILITY AND MARGINAL UTILITY

s s s ar lly o al l y a ar al l y. **Total utility** s o al a o o sa s a o or l as r a rso r s ro o s so s a y or a l , 10 s o a oo or s r . **Marginal utility** s *e a* sa s a o a o s r r al s ro o a o al o a ro , or - a l , ro 11 . l r a ly, a say a ar al l y s a o al l y a r s l s ro o s o o o or o a ro .

TOTAL UTILITY The total amount of satisfaction derived from the consumption of a single product or a combination of products.

MARGINAL UTILITY The extra utility a consumer obtains from the consumption of one additional unit of a good or service; equal to the change in total utility divided by the change in the quantity consumed.

igure 7-1 (**ey Graph**) a a o a y a l r al r la o o al l y a ar al l y. a ra r s ro a a a l . ol 2 s o s o al l y asso a a l lo o s o o s ar lar ro , a os ol s o s ar al l y a o al l y a r s l s ro o s o o a s ss a o. ar a or r -1(a), o s r a a o rs s r as s o al l y ( ) y a s a o . o al l y r a s a a a s a l s.

o, r -1( ) a ar al l y ( ) r a s os - s s ro rs s (a s o al l y r as s a a l ra). ar- al l y s ro or s (a s a o s ’ a o al l y). ar al l y o s a s as r o s ll (a s o al l y s all). r -1( ) a a l ol ll s a a s - ss a o y l s l ss ra l y, a r ls, a r o as o s r’s a or a os o s los r a los r o l ll .[1] r l a

---

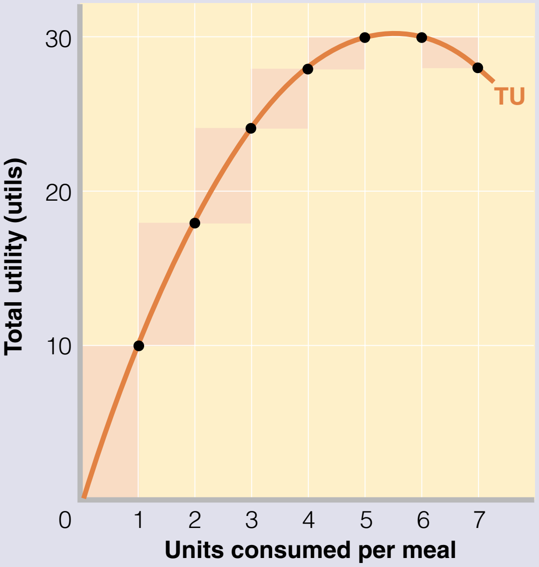
[1] In Figure 7-1(b) we graphed marginal utility at half-units. For example, we graphed the marginal utility of 4 utils at 3½ units because the 4 utils refers neither to the third nor the fourth unit per se but to the *addition* or *subtraction* of the fourth unit.

Key Graph

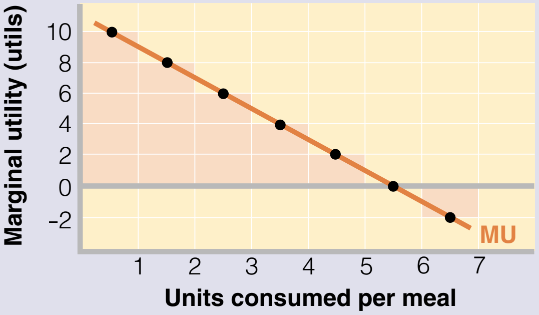
FIGURE 7-1 TOTAL AND MARGINAL UTILITY

Curves TU and MU are graphed from the data in the table. Panel (a): As more of a product is consumed, total utility increases at a diminishing rate, reaches a maximum, and then declines. Panel (b): Marginal utility, by definition, reflects the changes in total utility. Thus marginal utility diminishes with increased consumption, becomes zero when total utility is at a maximum, and is negative when total utility declines. As shown by the shaded rectangles in panels (a) and (b), marginal utility is the change in total utility associated with each additional taco. Or, alternatively, each new level of total utility is found by adding marginal utility to the preceding level of total utility.

(1) Tacos consumed per meal	(2) Total utility, utils	(3) Marginal utility, utils
0	0	
1	10	10
2	18	8
3	24	6
4	28	4
5	30	2
6	30	0
7	28	-2



(a) Total utility



(b) Marginal utility

Quick Quiz

1. Marginal utility

a. is the extra output a firm obtains when it adds another unit of labour.
b. explains why product supply curves slope upward.
c. typically rises as successive units of a good are consumed.
d. is the extra satisfaction from the consumption of one more unit of some good or service.

2. Marginal utility in Figure 7-1(b) is positive, but declining, when total utility in Figure 7-1(a) is positive and

a. rising at an increasing rate.
b. falling at an increasing rate.
c. rising at a decreasing rate.
d. falling at a decreasing rate.

3. When marginal utility is zero in panel (b), total utility in panel (a) is

a. also zero.
b. neither rising nor falling.

c. negative.
d. rising but at a declining rate.

4. Suppose the person represented by these graphs experienced a diminished taste for tacos. As a result the
a. TU curve would get steeper.
b. MU curve would get flatter.
c. TU and MU curves would shift downward.
d. MU curve, but not the TU curve, would collapse to the horizontal axis.

Answers

1. d; 2. c; 3. b; 4. c

ar al l y l s as o s r a r s a o al s o a ro - s o as **law of diminishing marginal utility**. (*Key Question 2*)

LAW OF DIMINISHING MARGINAL UTILITY As a consumer increases the consumption of a good or service, the marginal utility obtained from each additional unit of the good or service decreases.

MARGINAL UTILITY, DEMAND, AND ELASTICITY

o o s la o s ar al l y la y a r or a ro slo s o ar a s r s a , s ss s o a oo y l s all r a s all r a o s o ar al, or ra, l y, o - s r ll y a o al s o a ro o ly s r alls. o s r or o r -1 s r l a ay y o a os a a r o $1 a , a s l ss ar al l y s o a ro a o al a os, o s r ll oos o o y or a a r . o s r o l ra r s a o al ollars o ro s a ro or (or al) l y, o l ss l y. r or , a o al a os l ss l y ar o or y l ss r l s. (ar- al l y o s a , r s a ra o l a o ay yo o o s a o r a o!) s, s ar al l y s or s a a r s r as or a y a o r as . o r or s, o s rs a ays a a a r s o ar slo .

a o y ar al l y l s as or s o a ro ar o - s l s s o r a ro ’s r las y o a . r s al, ar al l y alls s ar ly as s ss s o a ro ar o s , a s las . l r ll l o ly a r la ly s all r as a y a , s o ra s alls so ra ly. o rs ly, o - s l s ar al l y as o s o r as s ly a las a . ar lar l r ll o s rs o y o s ra ly or s o ro , s o a o al s l s so slo ly.

QUICK REVIEW

- The law of demand can be explained in terms of the income effect (a decline in price raises the consumer’s purchasing power) and the substitution effect (a product whose price falls is substituted for other products).
- Utility is the benefit or satisfaction a person receives from consuming a good or a service.
- The law of diminishing marginal utility indicates that gains in satisfaction become smaller as successive units of a specific product are consumed.
- Diminishing marginal utility provides another rationale for the law of demand, as well as one for differing price elasticities.

THEORY OF CONSUMER CHOICE

KEY CONCEPTS **Choosing a Little More or Less**

a o o la la o a , a o s ar al l-y la s o o s rs allo a r o y o a o a y oo s a s r s a a la l or r as .

Consumer Choice and Budget Constraint

y al o s r's s a o as ollo s o s.

- ***Rational behaviour*** o s rs ar ra o al o l o ry o s r o y o s o r r a s a o o sa s a o , or l y, ro . o s rs a o os or r o y or, ally, o a - r o al l y. y a **rational behaviour**.

RATIONAL BEHAVIOUR Human behaviour based on comparison of marginal costs and marginal benefits; behaviour designed to maximize total utility.

- ***Preferences*** a o s r as l ar- r r s or r a oo s a s r s o os a a la l ar . ass y rs also a a oo a o o ar al l y y ll ro s ss s o ar o s ro s y r as .
- ***Budget constraint*** a y o o s r as a , l a o o o y o . a o s r s l s a a o o a a ro r y r so r s o so y, a ar s o ly l o . s, ry o s r a s a o o s s all a **budget constraint** (l a o), os o ar ll o s o ollars a y ar. o rs , os o s ra s ar or s r or o s rs a ra o s a or os raor ar ly o s.

BUDGET CONSTRAINT The limit that the size of a consumer's income (and the prices that must be paid for goods and services) imposes on the ability of that consumer to obtain goods and services.

- ***Prices*** Goo s ar s ar r la o a or , so ry oo ar-r s a r a . ass a os r a s ar o a y a o s o s oo s a a rso ys. r all, a rso 's r-as s a s l ar o o al a , a s o s r as a l - r o ollars, a a y o ly a l a o o oo s. o s rs a o y ry y a . s o r s o r al-y o s ar y o a o s r.

o o s r s o ro s a s oos os sa s y o oo s a s r s. r als ll oos r s. s Glo al r-s .1 s o s, ay ary ro a o o a o .

Utility-Maximizing Rule

all r o a o s o oo s a s r s o s rs a o a r s, s o a o ll y l a l y or sa s-a o or a rso o a sa s a o , *con me ho ld alloca e hei mone income o ha he la dolla en on each od c ield he ame amo n of e a (ma ginal) ili .* all s **utility-maximizing rule**. o s r as ala s or r ar s s s r l , o s s o al r - r a r . o s r s l r a o l ors o o al l y o l l a y al ra o o rr l o oo s r as , ro- o a o rs as , o , ro s, or r s.

UTILITY-MAXIMIZING RULE To obtain the greatest utility, the consumer should allocate money income so that the last dollar spent on each good or service yields the same marginal utility.

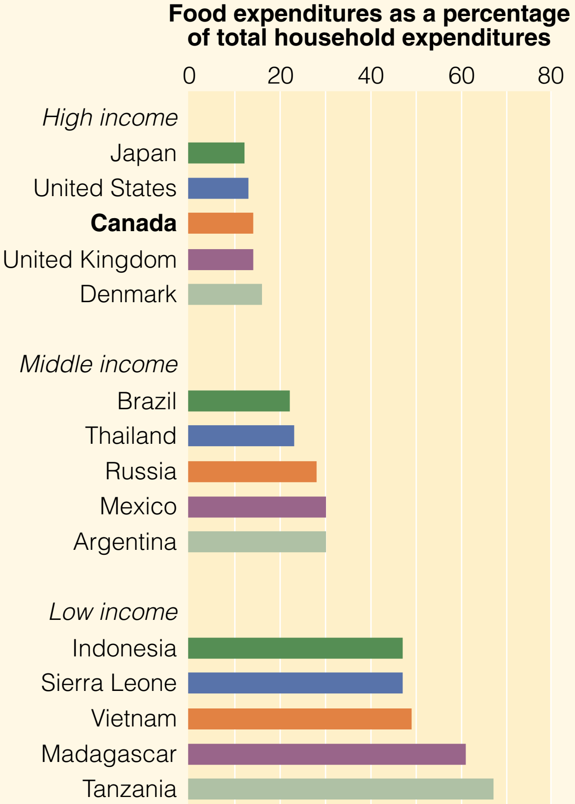
Numerical Example

ll s ra o ll l la l y- a r l . or s l y o r a - l s l o o ro s, a alys s o l a ly r r or .

GLOBAL PERSPECTIVE 7.1

Shares of household expenditures spent on food, selected nations

Consumer spending patterns differ not only individually but also nationally. One striking feature is that household food expenditures as a percentage of total household spending are much higher in low-income countries than in middle-income or high-income countries.



Source: World Bank. Data are for 1998, <www.worldbank.com>.

os o s r olly s ry o o a o o o ro s s s o l r as r a ly o o $10. s ro s as ara- s a r a s s, a r o s a a a as, or a l s a ro ol . 's s all a .

<www.econtools.com/jevons/java/choice/Choice.html> llustrates utility maximization subject to a budget constraint

olly's r r s or ro s a a r r s ar as a a r- o a o a ll a r sa s a o . a l -1 s ar s os a a, ol 2(a) s o a o o ar al l y olly ll r ro a s ss o a ol (a) s o sa or ro . o ol s r la o s ar al l y, s ass o s o o a ro r as .

MARGINAL UTILITY PER DOLLAR

or a ly l y- a r l o s a a, s ar al l y or a o ol s 2(a) a (a) o a r- ollar-s as s. olly's o s ar o o ly y ra l y a s ss s o ro ll y l also y o a y ollars (a r or o a y s o al r- a ro) s s oo a os a s o . ra o al o s r s o ar ra l y ro a ro s a os (a s, s r). os yo r ra a os ar al l y s,

TABLE 7-1 THE UTILITY-MAXIMIZING COMBINATION OF PRODUCTS A AND B OBTAINABLE WITH AN INCOME OF $10*

(1) Unit of product	(2) Product A: price = $1		(3) Product B: price = $2	
	(a) Marginal utility, utils	(b) Marginal utility per dollar (MU/price)	(a) Marginal utility, utils	(b) Marginal utility per dollar (MU/price)
First	10	10	24	12
Second	8	***8***	20	10
Third	7	7	18	9
Fourth	6	6	16	***8***
Fifth	5	5	12	6
Sixth	4	4	6	3
Seventh	3	3	4	2

* s ass s a l a a o o ar al l y r ro a o al s o a o o ro s s o a y o o r ro . or a l , ar al- l y s l or ro s o a o o o a y o s r.

say, ls o a o os ar al l y s 2 ls. a’s r s $12 a o os s o ly $, yo o l oos o ra r a a! y a s ar al l y r ollar s o l ls or o (2 ls $) o ar o o ly ls or a (ls $12). o o l y o o s or $12 a , ass a ar al l y o s o o s, say, 1 ls, yo r o al l y o l 0 ls. l arly, 0 s o sa s a o ro o o s ar s r or o ls ro sa $12 r o o a.

To make he amo n of e a ili de i ed f om diffe en l iced good com a able, ma ginal ili ie m be on a e -dolla - en ba i . o s ol s 2( ) a ( ) y ar al l y a a o ol s 2(a) a (a) y r s o a , $1 a $2, r s ly.

DECISION-MAKING PROCESS

a l -1 a olly’s r r s o a as s, a a r- ollar as s, as ll as r a s o a . $10 o s , a or r s o l olly allo- a r ollars o s o a o a s r o l y $10 l os y r o a s o a o o a ll s a o a a s s s r $10 o ra o ol s 2( ) a ( ) a l -1, a olly s o l rs s $2 o rs o , a s s ar al l y r ollar o 12 ls s r a ’s 10 ls. o olly s rs l r a o r s s o l y a s o o or rs o a s ar al l y r ollar o o s 10 ls. o s ys o o . olly o as o o a o s o . lso, las ollar s s o a oo y l sa ar al l y r ollar (10 ls), s o a o o a o s o r r s a a o o l y a olly a o a . os r o ly $ (1 × $1) + (2 × $2) , so s as $ r a , s a s o a a s ll r l l o o al l y. a ol s 2( ) a ( ) a a , a olly s o l s $2 o a r o a s ar al l y r ollar or r o s o ar or s o o . o , o o a r so ,s sa a r as o o a a o r o a s o ro ls r ollar. o olly r as s o or o a . o las ollar s o a ro ro s sa ar al l-y r ollar (ls), a olly's o y o o $10 s a s .

The ili -ma imi ing combina ion of good a ainable b Holl i o ni of A and fo of B. y s ar al l y or a o ro ol s 2(a) a (a), a olly so a 1 (10 +) ls o sa s a o ro o s o a (2 + 20 + 1 + 1) ls o sa s a o ro o r s o . r $10, o ally s , y l s (1 +) ls o sa s a o .

a l -2, s ar s o r s - y-s ro ss or a olly's l y, r s ar l s y. o a a l ly ass a olly s s r r o . r orro s or sa s. o r, sa a r ar as a o o y a y l s l y a or ora o o r a alys s. a , r a a ay s o a o s a r. (*Key Question 4*)

INFERIOR OPTIONS

olly a o a o r o a o s o a $10, o ll y l as r a a o al l y as o o s o a o ro . sa a l , s a o a o r s o a r o or $10. o r, s o a o y l s o ly ls, l arly r or o ls ro y o s o a o ro . r r or , o r o a o s o a s (s as o r o a o or o o a o o) ar al l y o las ollar s s sa or o a . ll s o a o s ar r o a a l olly's l o y o (as o r o a o) or o o a s r o y o (as o o a o o) a , r or , a l o y l a l y a a a l . s a r s , s os olly's o y o s $1 ra r a $10. a s l y- a o a o o a r a or al or r or oo s

Algebraic Restatement

r allo a o r l says a a o s r ll a sa s a o y allo a o y o so a las ollar s o ro , las o ro , a so or , y l al a o s o a o al, or ar al, l y. ar al

TABLE 7-2 SEQUENCE OF PURCHASES TO ACHIEVE CONSUMER EQUILIBRIUM, GIVEN THE DATA IN TABLE 7-1

Choice number	Potential choices	Marginal utility per dollar	Purchase decision	Income remaining
1	First unit of A First unit of B	10 12	First unit of B for $2	$8 = $10 – $2
2	First unit of A Second unit of B	10 10	First unit of A for $1 and second unit of B for $2	$5 = $8 – $3
3	Second unit of A Third unit of B	8 9	Third unit of B for $2	$3 = $5 – $2
4	Second unit of A Fourth unit of B	8 8	Second unit of A for $1 and fourth unit of B for $2	$0 = $3 – $3

l y r ollar s o s a y o ro y r o (ol 2( ) a l -1), a ar al l y r ollar s o y o ro y r o (ol ( ) a l -1). r l y- a r l r ly r r s a s ra os al. l ra ally,

$$\frac{\text{o ro}}{\text{r o}} \qquad \frac{\text{o ro}}{\text{r o}}$$

o rs , o s r s a s ra a la l o . a l -1 s o s s a o a o o o s o a o r o l lls s o o s a

$$\frac{\text{ls}}{\$1} \qquad \frac{1 \quad \text{ls}}{\$2}$$

a o s r's $10 o s s . a o s o l ll , so r allo a o o o s r's - r s a (ro lo o ar al- l y- r- ollar ro -) ll r as o s r's o al l y. or a l , o s r s $10 o o r s o a r o , o l a

$$\frac{\text{o} \quad \text{ls}}{\text{r o \$1}} \qquad \frac{\text{o} \quad 1 \quad \text{ls}}{\text{r o \$2}}$$

r las ollar s o ro s o ly s ls o sa s a o , a las ollar s o ro s (1 $2). o, o s r a r as o al sa - s a o y r as or o a l ss o . s ollars ar r allo a ro o , ar al l y r ollar o ll r as l ar al l y r ol-lar o ll r as . so o a o o a , o ll al, a o s r l r ll a . r , a o a o s o s o a o r o .

UTILITY MAXIMIZATION AND THE DEMAND CURVE

yo rs a l y- a r l , yo a as ly s y ro r a a y a ar rs ly r la . all a as r - a s o a al's a or a s ro ar (1) r r s or as s, (2) o y o , a ( ) r s o o r oo s. l y a a a l -1 r o r o s r's r r s. o o s os a r o y o s $10. o ra o o s r o o a s l a r or ro , ass a r o , r r s o r oo s, s s ll $1.

Deriving the Demand Schedule and Curve

a r as l o s r's a s l or ro y o s r al r a r s a sol a r a y o s r ll r as . a alr a y r o s r a y o a o l y- a a l as s, o , a r s o o r oo s, o r ra o al o s r ll r as o r s o a $2. o l 's ass r o alls o $1. ar al- l y- r- ollar a a o ol ( ) a l -1 ll o l a s r o as al a a or ol ( ) ar al o os ol (a), r as o o s o a o r o s o lo r a l r o a o . y a ly sa r aso s al l y- a a l , o a olly's l y- a o a o s o r so a s so . s s ar a l r -2, olly ll r as s so r o s $1. s a a s a l , a s o ar -slo a r D_B s o r -2. s r s , , l arly l s l y- a a o r o a o s r a a rso 's a r or a ar - lar ro .

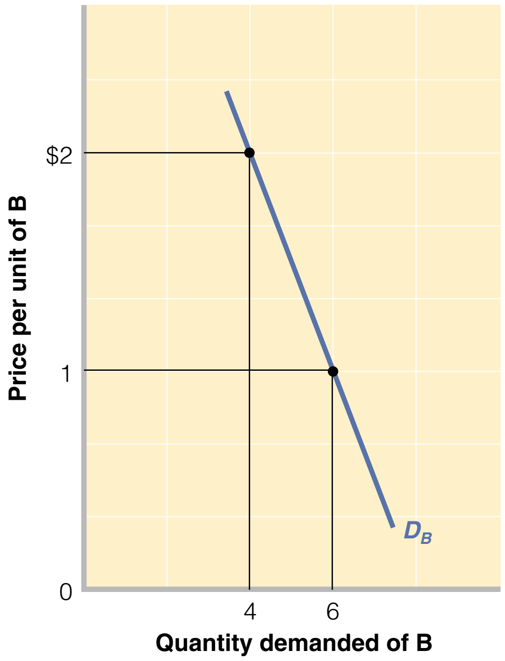
Income and Substitution Effects Revisited

o s a r o a la o a a rs oo r so s s o a o s. r a alys s o s o l s sor o s o s a a ly. o r, a s ro l y a a o o a s ol r as r as o ro r o alls.

o s s s o , r all a or r o l , olly as l r r as o so a o r so a $MU_A($ $)/P_A(\$1)$ $MU_B(1$ $)/P_B(\$2)$. r 's r alls ro $2 o $1, a $MU_A($ $)/P_A(\$1)$ $MU_B(1$ $)/P_B(\$1)$ or s ly s a , las ollar s o

FIGURE 7-2

At a price of $2 for product B, the consumer represented by the data in the table maximizes utility by purchasing four units of product B. The decline in the price of product B to $1 upsets the consumer's initial utility-maximizing equilibrium. The consumer restores equilibrium by purchasing six rather than four units of product B. Thus, a simple price–quantity schedule emerges, which locates two points on a downward-sloping demand curve.



Price per unit of B	Quantity demanded
$2	4
1	6

o y l s or l y (1 ls) a o s las ollar s o (ls). s
r s l a s a a s o r as s ro o s o r s or -
l r a s, a *b i ion* o o a r or ll o r r
o ro s.

a a o *income effec* ass l r o ro $2 o $1
r as s olly's r al o . or r l , olly as l r
y o s o a o r o . lo r $1 r or , olly o l
a o s o ly $ ra r a $10 o s sa o a o o oo s. as
$ l o r o s o or o , or o , or or o o . s or , r
l o as a s olly's *eal* o o r as so a s a o o a
lar r a o s o a sa $10 o *mone* o . or o o
r as r r as s o o s r as r al o s o .
(***Key Question 5***)

QUICK REVIEW

- The theory of consumer behaviour assumes that, with limited income and a set of product prices, consumers make rational choices on the basis of well-defined preferences.
- A consumer maximizes utility by allocating income so that the marginal utility per dollar spent is the same for every good purchased.
- We can derive a downward-sloping demand curve by changing the price of one product in the consumer-behaviour model and noting the change in the utility-maximizing quantity of that product demanded.

APPLICATIONS AND EXTENSIONS

a y r al- orl o a a la y a ly ory o o s r
a o r.

The Compact Disc Takeover

o a s s (s) a r a a a 1 . r ol o
r a l s s ry, s yl lo - lay r or ( ) o r al
o . 1 r a o ll o s r sol or r a o -
ar al os 210 ll o s. y 1 so o ll o s r sol , l
sal s o s l o 2. ll o .
s s r a o r s l ro o r a al y o s ra o s.
l o r o s as o l s a ly, r o lay rs as
os - . os $1000 or or a a a o, os lay rs rr ly s ll or l ss
a $1 0. or a l lay rs ar r lo r. l s a s ar *b-*
i e oo s, lay rs a s ar *com lemen a* oo s. lo r r or
lay rs as a r sal s a r a ly r as a or s. s
ol or s a s a ro a r ra o so a r a r
r ll a o s al o a s.
r s o o r a alys s, lay rs a s a r ra os o ar al l-
y o r a o lay rs a s. as a or y o o s rs a s-
o r a y a a r o al l y ys s s or s.

The Diamond–Water Paradox

arly o o s s s as a r l y a a so ss al oo s a lo r r s a so or a oo s. y o l a r, ss al o l , r lo a o s, a l ss s l ss ara o s r sol a o l a a r s r a s ly r la o a a s as a ry lo r r l r . a o s, o ras , ar rar a ar os ly o , , a ol s . a s r s ly s s all r la o a , r r s ry r ar .

ar al l y o las o a r o s s ry lo . r aso ollo s ro o r l y- a r l . o s rs (a ro rs) r s o o ry lo r o a r y s a r a al o or ra l r y, rr - a ro s, a l s, a r la s, rs , a so o . o - s o s a l ar al l y, l s as or a r s o s , als s lo r . o rs ly, r la ly a o s ar r as a s o r ro ly r , a a r ar al l y r a s . l r

<william-king.www.drexel.edu/top/prin/txt/MUch/Eco412.html>
Adam Smith and the diamond–water paradox

$$\frac{\text{o a r (lo)}}{\text{r o a r (lo)}} \quad \frac{\text{o a o s ( )}}{\text{r o a o s ( )}}$$

l o ar al l y o las o a r o s s lo a ar al l y o las a o r as s , o al l y o a r s ry a o al l y o a o s lo . o al l y r ro o s o o a r s lar a s o or o s a o s o a r o - s . o al l y s s o ar al l s o all l r s o a r o - s , l r ll o s o l r s a a ar r ar al l s a las o s . o ras , o al l y r ro a o s s lo s r r a s a r la ly o ar o . s a r a o ara o s sol a r as or o al l y (ro ly, s l ss) a a o s o r o a o s r a ly s r o a r. s r la r s r la o ar al l y, o o al l y.

The Value of Time

ory o o s r a o r as ral o a o or o- o al o *ime.* o o s o a ro o a . s a al - a l o o o o y y s a o r ro or , a rso a ar $, $10, $ 0, or or , o a o a s lls. y s a o r or l s r or o s o a s, al rs o or y os o or o o a sa r s $, $10, or $ 0 a o l a ar y or .

a a s l - loy o s r o s o s r y a ro o ol o o a , a a o r o o r. ar r o ol a s $ 0 a a o o r s $ 0, ol a a s or a o r . os s o s r s s o r o rs o ol o rs o ly o o rs a o r . o s r's s or $10 r o r as y $10 a o a y or , ll r o ol a s $ 0 ($ 0 ar- r l s $ 0 or o). larly, ll r o o r s $ 0 ($ 0 ar r l s $20 or o). a , o rary o a ar r s alo a , ll r o o r s r ally l ss a ll r o ol a .

o ass a ar al l s r ro s ss ol a s a o r s ar al, ra o al ory o l a a o r o s r s o l o s or ol a s a o r s a s ar r o or- r ($ 0) s lo r a a o la r ($ 0). s a o a o , s a o s r rs , a ol a s ($ 0) ar or s a o r s ($ 0). o, s ra o al or s rso o o s or o r s a ol a s. y a o or , a la r a o s r a l o a a ra- o al ory o s o la . ay ra o al or s ll or r or r r os as l l ar al o r a s ro o o o as a- oo , or ora , os s ry al a l , ll a r o y, o s ar s o ly a ra o o la ar . s s s l or r r , l o a o s o a a a l , o s a y o rs s o or ar a s a all or a lo r s a o or o . s ally ll or ly a ys a , or o rs r , o y a rso al o r o r r a a s or a a o s a s r sor s. o l o r a o s o l a a a a s ar as l o oo a o r a r al oo s o rly o o al r s o . a a a s o s lo o r s o l a s s as ally or s a r , l a r al oo s ar ry ly r a ar lly s . s r s ar o a ara o or a as o ra ally r ra s r s ar r a- r ly a ra o al r o a ro y o la o r a s r ally a a so y s a ar al , r as o os s r a lo - o , lo o ry.

Cash and Noncash Gifts

ar al l y a alys s also l s s rs a y o l rally r r as s o o as s os sa a o . r aso s s ly a o- as s ay o a r ’s r r s a s ay o a as as as o o al l y o s rs o r o r r s r a r o s a as ro s or o s. oo a a a l -1. os olly as ro ar o s o o a $2 as or a o as o o s o . a s o s o a o $2, s o s ar o al o ary al , y s - $2 as o rs o , olly o l o a 2 ls. o as o rs o s o o l y l o ly 1 (10 +) s o l y o- as s y l s l ss l y o ary a as . o o as s s o o , o s ra l al o os s s o ally los a s y o o a r r s’ as s. or a l , lo ay a a $1 or l o s a yo or yo r r ay, yo o l ay o ly $. 0 or . s, a $. 0, or 0 r , al loss s ol . l l y ll o s s o s a y ar, o al loss o al s lar . o o a loss s a o y r a ays als a l ro l . or a l , ly s s r s r s or r s o l a r a s o o as s r . lso, o l o a as r s or a s or s, so y a y oo s a ro or l y. o l a o or y l s y o so o ls a a la r . ll r a o s s or ro os o a als a a o s o a r o al l y.

The LAST word

CRIMINAL BEHAVIOUR

Although economic analysis is not particularly relevant in explaining some crimes of passions and violence (for example, murder and rape), it does provide interesting insights on such property crimes as robbery, burglary, and auto theft.

Through extension, the theory of rational consumer behaviour provides some useful insights on criminal behaviour. Both the lawful consumer and the criminal try to maximize their total utility (or net benefit). For example, you can remove a textbook from the campus bookstore either by purchasing it or stealing it. If you *buy* the book, your action is legal; you have fully compensated the bookstore for the product. (The bookstore would rather have your money than the book.) If you *steal* the book, you have broken the law. Theft is outlawed because it imposes uncompensated costs on others. In this case, your action reduces the bookstore's revenue and profit and also may impose costs on other buyers who now must pay higher prices for their textbooks.

Why might someone engage in criminal activity such as stealing? Just like the consumer who compares the marginal utility of a good with its price, the potential criminal compares the marginal benefit from an action with the price or cost. If the marginal benefit (to the criminal) exceeds the price or marginal cost (also to the criminal), the individual undertakes the criminal activity.

Most people, however, do not engage in theft, burglary, or fraud. Why not? The answer is that they perceive the personal price of engaging in these illegal activities to be too high relative to the marginal benefit. That price or marginal cost to the potential criminal has several facets. First, there are the guilt costs, which for many people are substantial. Such individuals would not steal from others even if there were no penalties for doing so; their moral sense of right and wrong would entail too great a guilt cost relative to the benefit from the stolen good. Other types of costs include the direct costs of the criminal activity (supplies and tools) and the forgone income from legitimate activities (the opportunity cost to the criminal).

Unfortunately, guilt costs, direct costs, and forgone income are not sufficient to deter some people from stealing. So society imposes other costs, mainly fines and imprisonment, on lawbreakers. The potential of being fined increases the marginal cost to the criminal. The potential of being imprisoned boosts marginal cost still further. Most people highly value their personal freedom and lose considerable legitimate earnings while incarcerated.

Given these types of costs, the potential criminal estimates the marginal cost and benefit of committing the crime. As a simple example, suppose that the direct cost and opportunity cost of stealing an $80 textbook are both zero. The probability of getting caught is 10 percent, and, if apprehended, there will be a $500 fine. The potential criminal will estimate the marginal cost of stealing the book as $50 (= $500 fine × .10 chance of apprehension). Someone who has guilt costs of zero will choose to steal the book because the marginal benefit of $80 will exceed the marginal cost of $50. In contrast, someone having a guilt cost of, say, $40, will not steal the book. The marginal benefit of $80 will not be as great as the marginal cost of $90 (= $50 of penalty cost + $40 of guilt cost).

This perspective on illegal behaviour has some interesting implications. For example, other things equal, crime will rise (more of it will be bought) when its price falls. This explains, for instance, why some people who do not steal from stores under normal circumstances participate in looting stores during riots, when the marginal cost of being apprehended declines substantially.

Another implication is that society can reduce unlawful behaviour by increasing the price of crime. It can nourish and increase guilt costs through family, educational, and religious efforts. It can increase the direct costs of crime by using more sophisticated security systems (locks, alarms, video surveillance) so that criminals will have to buy and use more sophisticated tools. It can undertake education and training initiatives to enhance the legitimate earnings of people who might otherwise engage in illegal activity. It can increase policing to raise the probability of being apprehended for crime, and it can impose greater penalties for those who are caught and convicted.

CHAPTER SUMMARY

1. The income and substitution effects and the law of diminishing marginal utility help explain why consumers buy more of a product when its price drops and less of a product when its price increases.
2. The income effect implies that a decline in the price of a product increases the consumer's real income and enables the consumer to buy more of that product with a fixed money income. The substitution effect implies that a lower price makes a product relatively more attractive and, therefore, increases the consumer's willingness to substitute it for other products.
3. The law of diminishing marginal utility states that, beyond a certain quantity, additional units of a specific good will yield declining amounts of extra satisfaction to a consumer.
4. We assume that the typical consumer is rational and acts based on well-defined preferences. Because income is limited and goods have prices, consumers cannot purchase all the goods and services they might want. Consumers therefore select the attainable combination of goods that maximizes their utility or satisfaction.
5. A consumer's utility is maximized when income is allocated so that the last dollar spent on each product purchased yields the same amount of extra satisfaction. Algebraically, the utility-maximizing rule is fulfilled when

$$\frac{\text{MU of product A}}{\text{Price of A}} = \frac{\text{MU of product B}}{\text{Price of B}}$$

and the consumer's total income is spent.
6. The utility-maximizing rule and the demand curve are logically consistent. Because marginal utility declines, a lower price is needed to induce the consumer to buy more of a particular product.

TERMS AND CONCEPTS

income effect, p. 156
substitution effect, p. 156
utility, p. 157
total utility, p. 157
marginal utility, p. 157
law of diminishing marginal utility, p. 159
rational behaviour, p. 160
budget contraint, p. 160
utility-maximizing rule, p. 160

STUDY QUESTIONS

1. Explain the law of demand through the income and substitution effects, using a price increase as a point of departure. Explain the law of demand in terms of diminishing marginal utility.
2. **KEY QUESTION** Complete the following table and answer the questions below.

Units consumed	Total utility	Marginal utility
0	0	
1	10	10
2	—	8
3	25	—
4	30	—
5	—	3
6	34	—

   a. At which rate is total utility increasing: a constant rate, a decreasing rate, or an increasing rate? How do you know?
   b. "A rational consumer will purchase only one unit of the product represented by these data, since that amount maximizes marginal utility." Do you agree? Explain why or why not.
   c. "It is possible that a rational consumer will not purchase any units of the product represented by these data." Do you agree? Explain why or why not.
3. Mrs. Wilson buys loaves of bread and litres of milk each week at prices of $1 and $.80, respectively. At present she is buying these two products in amounts such that the marginal utilities from the last units purchased of the two products are 80 and 70 utils, respectively. Is she buying the utility-maximizing combination of bread and milk? If not, how should she reallocate her expenditures between the two goods?
4. **KEY QUESTION** Columns 1 through 4 in the table below show the marginal utility,

measured in utils, that Ricardo would get by purchasing various amounts of products A, B, C, and D. Column 5 shows the marginal utility Ricardo gets from saving. Assume that the prices of A, B, C, and D are $18, $6, $4, and $24, respectively, and that Ricardo has an income of $106.

a. What quantities of A, B, C, and D will Ricardo purchase in maximizing his utility?

b. How many dollars will Ricardo choose to save?

c. Check your answers by substituting them into the algebraic statement of the utility-maximizing rule.

Column 1		Column 2		Column 3		Column 4		Column 5	
Units of A	MU	Units of B	MU	Units of C	MU	Units of D	MU	Number of dollars saved	MU
1	72	1	24	1	15	1	36	1	5
2	54	2	15	2	12	2	30	2	4
3	45	3	12	3	8	3	24	3	3
4	36	4	9	4	7	4	18	4	2
5	27	5	7	5	5	5	13	5	1
6	18	6	5	6	4	6	7	6	½
7	15	7	2	7	3½	7	4	7	¼
8	12	8	1	8	3	8	2	8	⅛

5. KEY QUESTION You are choosing between two goods, X and Y, and your marginal utility from each is as shown below. If your income is $9 and the prices of X and Y are $2 and $1, respectively, what quantities of each will you purchase to maximize utility? What total utility will you realize? Assume that, other things remaining unchanged, the price of X falls to $1. What quantities of X and Y will you now purchase? Using the two prices and quantities for X, derive a demand schedule (price–quantity demanded table) for X.

Units of X	MU_x	Units of Y	MU_y
1	10	1	8
2	8	2	7
3	6	3	6
4	4	4	5
5	3	5	4
6	2	6	3

6. How can time be incorporated into the theory of consumer behaviour? Explain the following comment: "Want to make millions of dollars? Devise a product that saves Canadians lots of time."

7. Explain:

a. "Before economic growth, there were too few goods; after growth, there is too little time."

b. "It is irrational for an individual to take the time to be completely rational in economic decision making."

c. "Telling Santa what you want for Christmas makes sense in terms of utility maximization."

8. In the past decade or so there has been a dramatic expansion of small retail convenience stores (such as Mac's, 7-Elevens, Beckers), although their prices are generally much higher than prices in large supermarkets. What explains the success of the convenience stores?

9. Many apartment-complex owners are installing water meters for each apartment and billing the occupants according to the amount of water they use, in contrast to the former procedure of having a central meter for the entire complex and dividing up the water expense as part of the rent. Where individual meters have been installed, water usage has declined 10 to 40 percent. Explain that drop, referring to price and marginal utility.

10. **Advanced analysis:** A mathematically fair bet is one in which a gambler bets, say, $100, for a 10 percent chance to win $1000 dollars ($100 = .10 × 1000). Assuming diminishing marginal utility of dollars, explain why this is *not* a fair bet in terms of utility. Why is it even a less fair bet when the house takes a cut of each dollar bet? So is gambling irrational?

11. **Advanced analysis:** Let $MU_A = z = 10 - x$ and $MU_B = z = 21 - 2y$, where z is marginal utility per dollar measured in utils, x is the amount spent on product A, and y is the amount spent on product B. Assume that the consumer has $10 to spend on A and B—that is, $x + y = 10$. How is the $10 best allocated between A and B? How much utility will the marginal dollar yield?

12. **(The Last Word)** In what way is criminal behaviour similar to consumer behaviour? Why do most people obtain goods via legal behaviour as opposed to illegal behaviour? What are society's main options for reducing illegal behaviour?

INTERNET APPLICATION QUESTIONS

1. The ESPN Sportszone, <wspn.sportzone.com>, is a major sports information site. Most of the content is free, but ESPN has a premium membership (articles marked with IN are only available through it) for a monthly or an annual fee. Similar but free sports content can be found at CNN/Sports Illustrated at <www.cnnsi.com> and CBS Sports Line at <cbs.sportsline.com>. Since ESPN has put a price tag on some of its sports content, it implies that the utility of a premium membership cannot be found at a free site and is, therefore, worth the price. Is this the case? Use the utility maximization rule to justify subscribing or not subscribing to the premium membership.

2. Assume that you and several classmates each receive a $300 credit voucher (good for today only) from Wal-Mart Online. Go to <www.wal-mart.com> and select $300 worth of merchandise. Use Add to Cart to keep a running total, and use Review Cart to print your final selection. Compare your list with your classmates' lists. What explains the differences? Would you have purchased your items if you had received $300 in cash to be spent whenever and wherever you pleased?

o

a r

INDIFFERENCE CURVE ANALYSIS

or a a la a o o o s r a o r a l r s as o (1) l s a (2) so- all r r s.

The Budget Line: What Is Attainable

BUDGET LINE A line that shows various combinations of two products a consumer can purchase with a specific money income, given the products' prices.

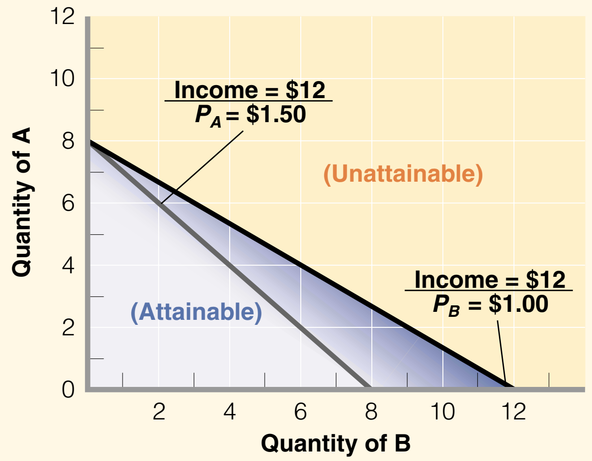
budget line (or, or ally, a *b dge con ain*) s a s l or r a s o s ar o s o a o s o o ro s a o s r a r as a s - o y o . r o ro s $1. 0 a r o ro s $1.00, a o s r o l r as all o a o s o a s o a l -1 $12 o o y o . o r , o s r s all o o so a a o l os o . r, y o so a r y r $, o s r o l a s so a r o . o r r , o s r o l y 12 s o a $1.00 a , s s or r r o y o o o l os o . r -1 s o s sa l ra ally. o a ra s o r s r o ol s o a as s a l . ry o o ra r r - s s a oss l o a o o a , l ra o al a s. slo o ra l as r s ra o o r o o r o or r s ly, a sol al o slo s P_B/P_A $1.00/$1. 0 2/ . s s a - a al ay o say a o s r s or o o s o (as r o r al a s) o y r s o (as r o or o al a s). o o or r l , o s o (a $1. 0 a) s o o a r or s o (a $1.00 a). s y l s a slo o 2/ . l as o o r s a ara r s s

TABLE A7-1 THE BUDGET LINE: WHOLE-UNIT COMBINATIONS OF A AND B ATTAINABLE WITH AN INCOME OF $12

Units of A (price = $1.50)	Units of B (price = $1.00)	Total expenditure
8	0	$12 (= $12 + $0)
6	3	$12 (= $9 + $3)
4	6	$12 (= $6 + $6)
2	9	$12 (= $3 + $9)
0	12	$12 (= $0 + $12)

1. *Income changes* lo a o o l ar s o y o . r as o y o s s l o r a r as o y o s s o l . o r y s, r al la a l -1, ass a o y o s (a) $2 a ( ) $ a lo l s r -1.

FIGURE A7-1 A CONSUMER'S BUDGET LINE



The budget line shows all the combinations of any two products that can be purchased given the prices of the products and the consumer's money income.

2. ***Price changes*** a ro r s also s s l . l r s o o ro s - al o a r as r al o s s r o r . (o a r y s y r al la a l -1 a r lo r -1 ass a P_A $. a P_B $. 0.) o rs ly, a r as r s o a s s r o l . (ss P_A $ a P_B $2 a r - or a l -1 a r -1 o s - s a a s s a .)

o a a s P_B a s l P_A a o y o r a o s a . ar lar, P_B ro s, say, ro $1.00 o $. 0, lo r o l a s o ar o r . o rs ly, P_B r as s, say, ro $1.00 o $1. 0, lo r o l a s ar o l . o s a s l r a s a or a s o r al a s a s P_A as o a .

Indifference Curves: What Is Preferred

l s r o ar a a, s ally o a r s. y r al o a o s o ro s a a a r as rr o y o a r s.

INDIFFERENCE CURVES Curves showing the different combinations of two products that yield the same satisfaction or utility to a consumer.

Indifference curves, o r, r s or a o a o o s r r r s or a . r r s o s all o a o s o o ro s a a ll y l sa o al sa s a o or o al l y o a o - s r. a l -2 a r -2 r s a y o al r r or ro s a . o s r's s r r s ar s a or s ll r al sa o al l y ro a o a o o a s o a l or o r . o s r ll r (ll o ar) as o o - a o s a ally o a . r r s a s ral or a ara r s s.

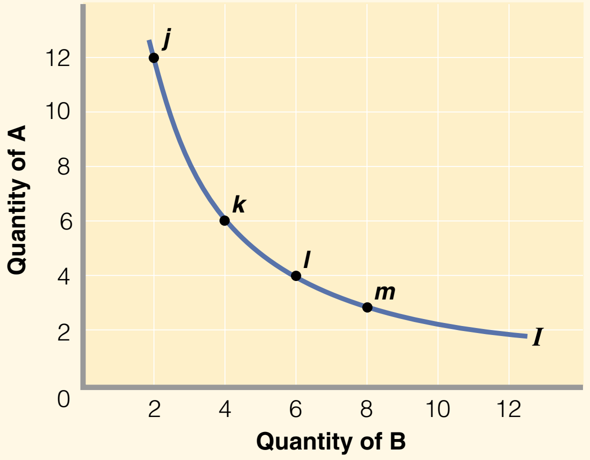
INDIFFERENCE CURVES ARE DOWNSLOPING

r r slo s o ar a s or o o ro a s l ss o o r, o al l y s or a a . os o s r o s ro o o a o o a o a o r, say, ro *j* o *k* r -2. so o , o s r o a s or o ro , r as o al l y. a s o al l y s sa ry r o r , o s r s so o o r ro , , o r o al l y y a r s ly o s a o . s or o ss a s l ss o , a a s o a ar rs ly

TABLE A7-2 AN INDIFFERENCE SCHEDULE (WHOLE UNITS)

Combination	Units of A	Units of B
j	12	2
k	6	4
l	4	6
m	3	8

FIGURE A7-2 A CONSUMER'S INDIFFERENCE CURVE



Every point on indifference curve *I* represents some combination of products A and B, and all those combinations are equally satisfactory to the consumer. That is, each combination of A and B on the curve yields the same total utility.

r la . r a r s rs ly r la ar a l s s o ar slo .

INDIFFERENCE CURVES ARE CONVEX TO THE ORIGIN

o ar -slo r a o a (o o ar) or o (o ar) o or . o a r as a r as (s r) slo as o o s o r , l a o r as a s (a r) slo as o o s o r . o r -2 a r r s o - o or . s slo s s or o s a r as o ro *j* o *k* o *l*, a so o o r . ally, slo o r r a a o as r s **marginal rate of substitution (MRS)** o o a o r r s y a o . slo or s o s ra a o - s r o oss ss s a o a o ll s s o oo or o r (say, or) o r a ally sa s . s slo o r r a s ll- ss o s s or s s as o o r .

MARGINAL RATE OF SUBSTITUTION (MRS) The rate at which a consumer is prepared to substitute one good for another (from a given combination of goods) and remain equally satisfied (have the same total utility); equal to the slope of a consumer's indifference curve at each point on the curve.

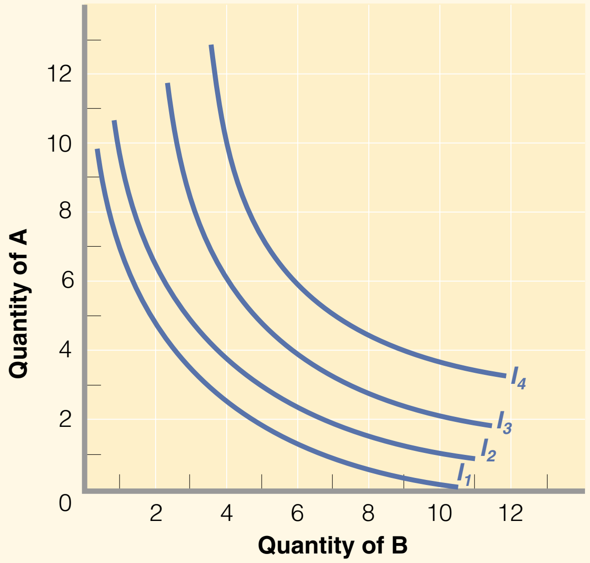
ra o al or s o y a s, or a s s a o - s rs' s ll ss o s s or (or or) ll o a o s o a y a o . o s r a l -2 a r -2 a a , a o *j*. r , r la r s, o s r as a s s a al a o o a ry l l o . s o a o , a o s ry al - a l (a s, s ar al l y s), l a o s l ss al a l (s ar- al l y s lo). o s r ll ll o a s s a al a o o o , say, o or s o . s as , o s r s ll o or o s s o o o or s o s /2 or . a o *k* o s r as l ss a or . r s so a or al - a l a l ss al a l a ar . a o ro o *k* o o *l*, o s r s ll o o ly o s o o o or s o , so s o ly 2/2 or 1. a s ll l ss o a or o a o *l*, o s r s ll o o ly o o r r or o or s o a alls o 1/2. G rally, as a o o *inc ea e* , ar al l y o a o al s o *dec ea e* . larly, as a y o *dec ea e* , s ar al l y *inc ea e* . r -2 s a o o r , o s r ll ll o s all r a s all r a o s o o o s a r a a o al o . r s l s a r a s slo , a r a s o o or - . l s as o o s so as alo r r .

<ingrimayne.saintjoe.edu/econ/MaximizingBeha/Indifference.html> Another look at indifference curves

The Indifference Map

s l r r o r -2 r s so o s a (s) l lo o al l y or sa s a o . s oss l a s l o s a ol s r s

FIGURE A7-3 AN INDIFFERENCE MAP



An indifference map is a set of indifference curves. Curves farther from the origin indicate higher levels of total utility. Thus, any combination of products A and B represented by a point on I_4 has greater total utility than any combination of A and B represented by a point on I_3, I_2, and I_1.

o r r s or a **indifference map**, as s o r - . a r r s a r l lo o al l y. ally, a r o r o o r or al r (la ll I r -) r s o a o s o a a y l or l y a I . a r o l o I r s l ss o al l y a I . s o o ro or , a s ss r r r r s s a r l l o l y. o o s ra s a , ra al a or as rly r o ro or o a s o s o rs o s ss r s al lar r a o s o o a a , r or , r l ls o o al l y.

Equilibrium at Tangency

a s r s -1 a - ar al, a s r os a l o o s r's r a , as s o r - . y o , l - a s all o a o s o a a o s r a a a s or r o y o r s o a . s a a a l o a o s, o s r ll r r a o a o a y l s r a s sa s a o or l y. ally, l y- a o a o ll o a- o ly o s a a a l r r , s all o s r's **equilibrium position**.

r - o s r's l r os o s a o X, r l s *angen* o I . y o o Y a s Y s o a lo r r r , I_2. y o o l y s ollars ro r as s o o r as s o o s r a a a a r r ar r ro or a r y r as o al l y r ro sa o . y o o Z or sa r aso as or Y o Z s o a lo r r r , I_1. y o l y r allo a ollars ro o o s r a o r r r I a r as o al l y.

o a o o W o r r I l s r a W o l y l a r a r o al l y a X, o W s yo (o s) l a , , s *no* a a a l y o s r. o X r r s s o al *a* *ainable* o - a o o ro s a . o a , a or o o o a y, slo o s a a a l r r als slo o l . a s slo o r r r s (ar al ra o s - s o) a slo o l s P_B/P_A, o s r's o al or - l r os o s o r

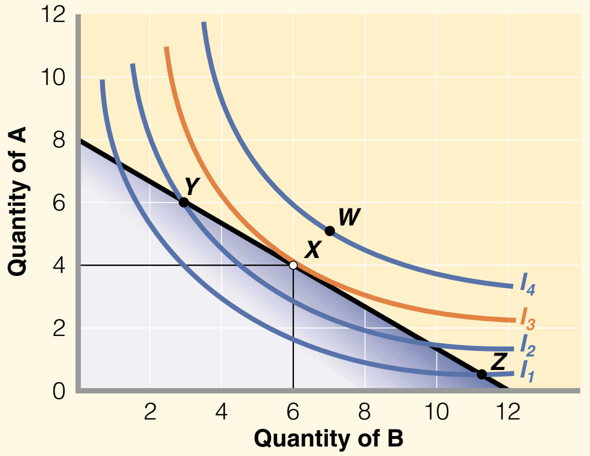
$$\frac{P_B}{P_A}$$

(o ay y ry o a s r *Key Question 3* a s .)

INDIFFERENCE MAP A series of indifference curves, each of which represents a different level of total utility and together show the preferences of the consumer.

EQUILIBRIUM POSITION The combination of products that yields the greatest satisfaction or utility.

FIGURE A7-4 THE CONSUMER'S EQUILIBRIUM POSITION



The consumer's equilibrium position is represented by point *X*, where the black budget line is tangent to indifference curve I_3. The consumer buys four units of A at $1.50 per unit and six of B at $1.00 per unit with a $12 money income. Points *Z* and *Y* represent attainable combinations of A and B that yield less total utility, as is evidenced by the fact that they are on lower indifference curves. Point *W* would entail more utility than *X*, but it requires a greater income than the $12 represented by the budget line.

The Measurement of Utility

r s a or a r
ar al l y ory o o s r a
a r r ory. ar al
l y ory ass s a l y s *n me icall*
as ra l , a s, a o s r a say
o ra l y or s r s ro
a ra o or . o s r s
a or a o o r al l y- a -
(l r) os o , as a y

$$\frac{\text{ar al l y o}}{\text{r o}} \qquad \frac{\text{ar al l y o}}{\text{r o}}$$

r r a roa os s a l ss
s r r r o o s r, o
o ly s y r a ar lar o -
a o o a ll y l or , l ss, or
sa a o o l y a so o r o -
a o o a . o s r o ly say,
or a l , a s s o a s o
ll y l or (or l ss) sa s a o a o r o
a o . r r ory o s
o r r a o s r s y *ho m ch*
or (or l ss) sa s a o ll r al .
o ar l r s a o s
o or s, a r-
r a alys s, als P_B/P_A a
l r o r, ar al l y
a roa , ra o o ar al l s als
P_B/P_A. r or a a l r , s al ar-
al l y a roa o ra o o ar al l s o las r as s
o o ro s.[2]

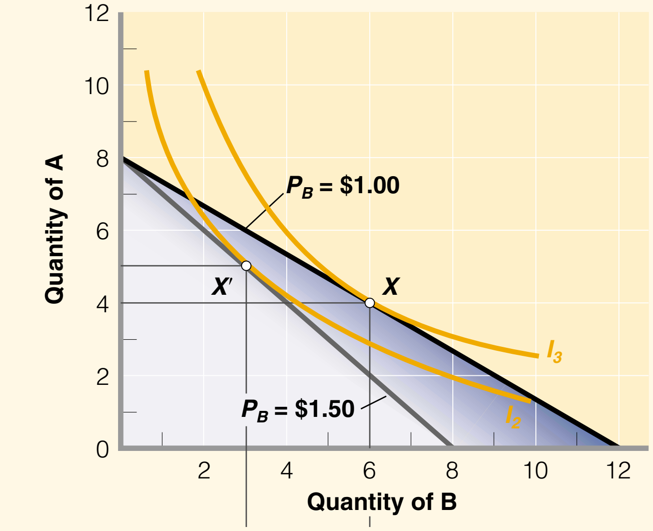
The Derivation of the Demand Curve

o arl r a a r or , a r as r o ll
a s o o o l o a ar o l . a s a a
o r a a r or ro . r - (a) r ro ar
o r - a s o s o r al o s r l r a o *X*.
l r s l r os o ass s a o y o s $12 a
a P_A $1. 0 a P_B $1.00. 's s a a s o l r os -
o r as P_B o $1. 0 a ol o o y o a r
o o s a .

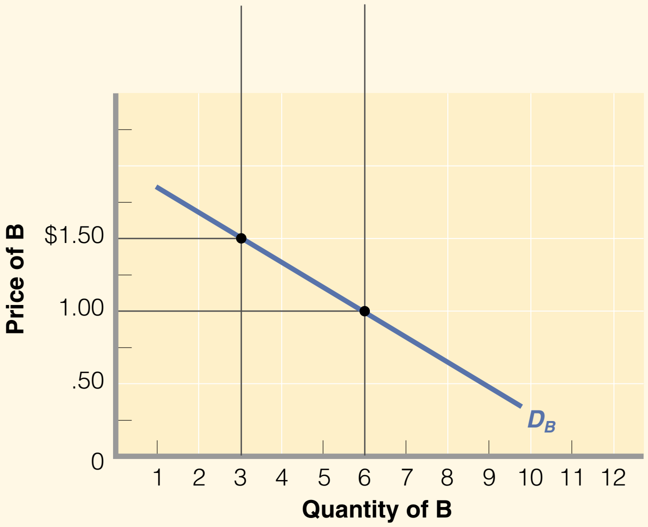
---

[2] If we begin with the utility-maximizing rule, $MU_A/P_A = MU_B/P_B$, and then multiply through by P_B and divide through by MU_A, we obtain $P_B/P_A = MU_B/MU_A$. In indifference curve analysis we know that at the equilibrium position MRS = P_B/P_A. Hence, at equilibrium, MRS also equals MU_B/MU_A.

FIGURE A7-5 DERIVING THE DEMAND CURVE



(a) Two equilibrium positions



(b) The demand curve for product B

Panel (a): When the price of product B is increased from $1.00 to $1.50, the equilibrium position moves from *X* to *X*′, decreasing the quantity of product B demanded from six to three units. Panel (b): The demand curve for product B is determined by plotting the $1.00–six-unit and $1.50–three-unit price–quantity combinations for product B.

r s l s s o r - (a).
l a s o l , y l a -
l r o *X*′ r s a o lo r
r r I_2. *X*′ o s r ys
r s o a o o ar
o r o a s o a *X*. r r s s ,
a o a s or a o o
lo a o o s o a r or
ro . o a a l r o
X, r o s $1.00 a s s ar r-
as a l r o *X*′, r o s
$1. 0 a r s ar r as .
s a a ar s o ra ally r
- ( ) as o s o o s r's a
r or . o a or o al a s o -
r - (a) a ( ) ar al o as r
a y a o . a r -
or ro r al r r l s ro r
- (a) o o or o al a s o r
- ( ). r al a s o r - ( )
lo a o os r s o . o
a s r s y l r l a a s
a , lo a o o s o
a r or . y s l a la o o
r o a r r
l o , a o a a o ar -
slo a r or . a s
a a r la o a ass
o r s ar al, s o ly r o
as a (r o a o s r's
o y o a as s r a o s a).
s as , a r a r
o r sor o s o a l ass -
o a o s rs a as r l y s
all ls. s r r a roa ,
o s rs s ly o ar o a o s o
ro s a a r o -
a o y r r r o s a
r s o o ro s.

APPENDIX SUMMARY

1. The indifference curve approach to consumer behaviour is based on the consumer's budget line and indifference curves.
2. The budget line shows all combinations of two products that the consumer can purchase given product prices and money income.
3. A change in either product prices or money income moves the budget line.
4. An indifference curve shows all combinations of two products that will yield the same total utility to a consumer. Indifference curves are downward sloping and convex from the origin.
5. An indifference map consists of a number of indifference curves; the farther from the origin, the higher the total utility associated with a curve.
6. The consumer is in equilibrium (utility is maximized) at the point on the budget line that lies on the highest attainable indifference curve. At that point the budget line and indifference curve are tangent.
7. Changing the price of one product shifts the budget line and determines a new equilibrium point. A downsloping demand curve can be determined by plotting the price–quantity combinations associated with two or more equilibrium points.

APPENDIX TERMS AND CONCEPTS

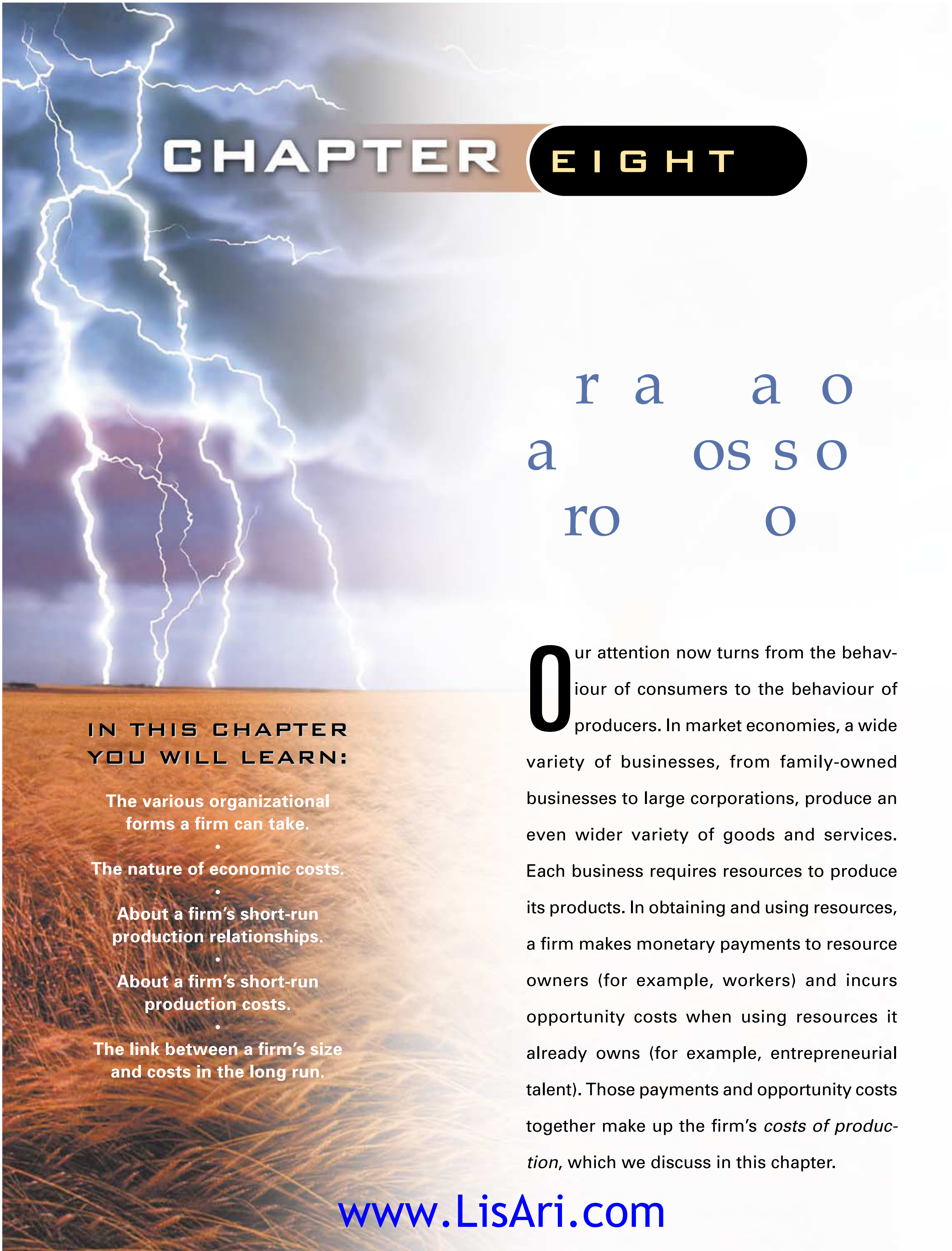
budget line, p. 173
indifference curves, p. 174
marginal rate of substitution (MRS), p. 175
indifference map, p. 176
equilibrium position, p. 177

APPENDIX STUDY QUESTIONS

1. What information is embodied in a budget line? What shifts occur in the budget line when money income (a) increases and (b) decreases? What shifts occur in the budget line when the price of the product shown on the vertical axis (a) increases and (b) decreases?
2. What information is contained in an indifference curve? Why are such curves (a) downward sloping and (b) convex from the origin? Why does total utility increase as the consumer moves to indifference curves farther from the origin? Why can't indifference curves intersect?
3. **APPENDIX KEY QUESTION** Using Figure A7-4, explain why the point of tangency of the budget line with an indifference curve is the consumer's equilibrium position. Explain why any point where the budget line intersects an indifference curve is not equilibrium. Explain: "The consumer is in equilibrium where MRS = P_B/P_A."
4. Assume that the data in the accompanying table give an indifference curve for Mr. Chen. Graph this curve, putting A on the vertical axis and B on the horizontal axis. Assuming that the prices of A and B are $1.50 and $1.00, respectively, and that Mr. Chen has $24 to spend, add his budget line to your graph. What combination of A and B will Mr. Chen purchase? Does your answer meet the MRS = P_B/P_A rule for equilibrium?

Units of A	Units of B
16	6
12	8
8	2
4	24

5. Explain graphically how indifference analysis can be used to derive a demand curve.
6. **Advanced analysis:** Demonstrate mathematically that the equilibrium condition MRS = P_B/P_A is the equivalent of the utility-maximizing rule $MU_A/P_A = MU_B/P_B$.



CHAPTER EIGHT

r a a o
a os s o
ro o

IN THIS CHAPTER YOU WILL LEARN:

The various organizational forms a firm can take.

•

The nature of economic costs.

•

About a firm's short-run production relationships.

•

About a firm's short-run production costs.

•

The link between a firm's size and costs in the long run.

Our attention now turns from the behaviour of consumers to the behaviour of producers. In market economies, a wide variety of businesses, from family-owned businesses to large corporations, produce an even wider variety of goods and services. Each business requires resources to produce its products. In obtaining and using resources, a firm makes monetary payments to resource owners (for example, workers) and incurs opportunity costs when using resources it already owns (for example, entrepreneurial talent). Those payments and opportunity costs together make up the firm's *costs of production*, which we discuss in this chapter.

s ral a rs, r ro a , ro r s, a r a o a alys s a la o r s o ar r s a os s r o o ro . r l a r os s o s o o os o ar so s r la o o o y.

THE BUSINESS SECTOR

r a or a s ral ays. ll s l o s s a o a la , a r , a a s ry.

PLANT A physical establishment that performs one or more functions in producing, fabricating, and distributing goods and services.

FIRM An organization that employs resources to produce a good or service for profit and owns and operates one or more plants.

INDUSTRY A group of firms that produce the same or similar products.

- **plant** s a ys al s a l s a a ory, ar , , s or , or ar - o s a r or s o or or o s ro , a r a , a s r oo s a s r s.
- **firm** s a s ss or a a o a o s a o ra s la s. o r s o ra o ly o la , a y o a o ra s ral.
- **industry** s a ro o r s a ro sa , or s lar, ro s.

or a a o al s r r s o r s ar o o l a ar . *M l i lan m* ay or a or o ally, s ral la s r or sa - o . a l s ar l l o l la s o o a- ola a a y - al a a a r s or s. r s ay *e icall in eg a ed,* a y o la s a r or r o s ar o s s a s o ro o ro ss. or a l , o l o a s s as ro- a a a o o l l s, r r s, a r a l asol s a o s. o r s ar *conglome a e* , so a a s y a la s a ro ro s s ral s r s. or a l , o r or . o ra s s rs l s as o a o s, a s r al, a al, a r y s r s.

SOLE PROPRIETORSHIP An unincorporated firm owned and operated by one person.

PARTNERSHIP An unincorporated firm owned and operated by two or more people.

CORPORATION A legal entity chartered by the federal or provincial governments that operates as a distinct and separate body from the individuals who own it.

Legal Forms of Businesses

s ss o la o s r ly rs , ra ro a or ora o s s as or l, sal s 2000 o . .$ 0 ll o a or a , 00 loy s orl , o o r oo s al y s o s a o -a - o ro r s o or o loy s a sal s o o ly $200 o $ 00 r ay. r ar r a or l al or s o s ss s.

1. **sole proprietorship** s a s ss o a o ra y o rso . s - ally, ro r or (o r) rso ally s r s s s o ra o .
2. **partnership** or o s ss or a a o s a a ral o ro o sol ro r ors . a ar rs , o or or als (ar rs) a r oo a o ra a s ss o r. s ally y ool r a al r so r s a s ss s lls. o s ly, y s ar r s s a ro - s or loss s.
3. **corporation** s a l al r a o a a a r r so r s, o ass s, ro- a s ll ro s, r s, r , s a s , a r- or o s o a y o r y o r r s . or ora o s s a s ara ro al s o ol rs o o . r a a rs r os or ora o s.

Advantages and Disadvantages

a or o s ss r r s as a a a s a sa a a s.

SOLE PROPRIETORSHIPS

ol ro r ors s ar ry ro s a s y ar asy o s a or a - r s r ally o r a or l al s . ro r or s oss a as s s a al r o o a o . a s ro r or's ro o s o r r s 's s ss, s ro s s o a a s ss ly.

ol ro r ors s also a s ral sa a a s. rar o s, a al r so r s o a sol ro r ors ar s o r r o ro o a lar r r s . a s ar s ally l o a ro r or as a a a orro . ro r ors s o a l, o r al a s ar o a r o r .

lso, o ally ar o a r r s ss a s a ro r or arry o all a a o s. ro r or s a s o s o y a s ll , r a ra o rso l, a ro , a r s , a s- r r 's ro . s or , o al s o s al a o s- ss a a ar o a a la l o y al s all-s al ro r ors .

ally, a os or a , ro r or s s o *nlimi ed liabili* . - als s ss or s l s r s o o ly ass s o r r r- so al ass s as ll. ass s o a s ss l sol ro r ors ar s o ay r 's lls, r ors a l la s a a s ro r or's rso al ro r y.

PARTNERSHIP

sol ro r ors , a ar rs s asy o or a . l o ar - rs s ally s a r a r , r s o l al r a or l al s . lso, r a r s al a o a a s oss l , a s a ar r- s as o or or ar a s, a , a s r s or a o o r, a al r so r s o a ar rs ar l ly o r a r a r so r s o a sol ro r ors . o s ly, ar r a s r ar ar rs s as so - a r r s s a sol ro r ors s.

ar rs s a so o s or o s o ro r ors a also so o r o . r s ral o l ar a a a , a or y ay l a o o s s ol s or o a o a o s r r . ors , ar rs ay sa r o as ol y. l o a s o ar r- s s ar rally s r or o sol ro r ors s, a s o ar rs s ar s lls r ly l . o a al r so r s o r or o r ar rs ay s ll o o o s r ro o a s ss l r r s .

o y o a ar rs s r ar o s. G rally, o ar r s or ra s, ar rs s ssol a r or a , a l s- r o o s o ra o s. ally, l l a l y la s a ar rs , s as o s a ro r ors . a ar r s l a l or all s ss s rr , o o ly as a r s l o ro r or a also as a r s l o r or a o a y o r ar r. al y ar rs r s r al o r o l ss a ar rs.

CORPORATION

a a a s o or ora or o s ss r r s a a a l o a o a os o a a a. l o or ora o s ar r la ly s all - r, a y o ar lar s a s al o o ra o s. or ora o s y ar os or o s ss or a a o or ra s a al a al (o y). or ora o loys o s o a s ll o s o s a o s a a l o ool a al r so r s o lar rs o o l .

STOCKS Ownership shares in a corporation.

BONDS Financial devices through which a borrower (a firm or government) is obligated to pay the principle and interest on a loan at a specific date in the future.

Stocks ar s ar so o rs o a or ora o , r as **bonds** ar ro s s or ay a loa , s ally a a s ra o r s (s as or a o s a r). a a sal s o s o s a o s also ro s a a a s o os o r as s *ec i ie* . a a s oss l or a o s ol o o a ar o s ss a o s ar o ary r ar s o a ly a a r . al s or a s r a r s s y y s r s o s ral or ora o s, a s s ally asy or ol rs o or ora s r s o s ll r ol s. r a s o a s s l y ra s r o s r s ro s ll rs o y rs. s as o sal r as s ll ss o sa rs o a a al s s or ora s r s. or ora o s a as r a ss o a r a o r y s o s ss or a a o s o, a s or ora o s ar r r s s, y ar or l ly o o ro a l l s o a s.

LIMITED LIABILITY Restriction of the maximum loss to a predetermined amount for the owners (stockholders) of a corporation; the maximum loss is the amount they paid for their shares of stock.

or ora o s a s a a a o **limited liability**. o rs (s o - ol rs) o a or ora o r s o ly a y a or r s o . r rso al ass s ar o a s a or ora o a l s o s s. r ors a s or o- ra o as a l al y a o s o rs o or ora o as als.

a s o ra l y o a ra a al a al, s ss l or ora o s a as- ly a s o o r o ra o s a r al s o a s o . or a l , y a a a a o ass- ro o olo s a s o o la o r. or ora o a r s al s s ro o , a o , a ar o s, a s ro y.

s a l al y, or ora o as a l o s o rs a s o - rs. ally, a l as , or ora o s ar or al. ra s r o or ora o r- s ro r a or sal o s o o s o sr o y o or ora o . or ora o s a r a a s o o lo -ra la - a ro .

or ora o ’s a a a s ar o r o s s a a y ally o r- r a y asso a sa a a s, y or ora or as r a ra a s. o r a a l al s ar ol o a a or ora ar r. ro so al o o , or ora or o r r s l s s l o r a a s s a s or ora o s a l al y, s r lo s s ss o rs a so s a o rso al r s o s l y or s o a l s ss a s y a o or ora or o r r s .

DOUBLE TAXATION The taxation of both corporate net income (profits) and the dividends paid from this net income when they become the personal income of households.

sa a a o o rs o or ora o s s **double taxation** o so or- ora o . or ora ro a s s ar a o s o ol rs as *di idend* s a o as or ora ro a a a as s o ol rs’ rso al o .

The Principal–Agent Problem

PRINCIPAL–AGENT PROBLEM A conflict of interest that occurs when agents (workers or managers) pursue their own objectives to the detriment of the principal’s (stockholders) goals.

a y a a a or ora o s ar r ly lar a a s r a s a o al ro l . sol ro r ors s a ar rs s, o rs o r al a a - al ass s o r oy r o rol o os ass s, o rs o lar or- ora o s ss r a o r s or r s o o sa s o s o ol rs. o rs o a or ora o s ally o o a a , y s a r o rs o o so.

a ra a r a a **principal agent problem**. *inci al* ar s o - ol rs o o or ora o a o r s as r a s or s ss o r al . r s s o s a a rs (a s) a s s o o rs (r als) o o al ays o . o rs y ally a a o a y ro a s o r . a s, o r, ay a o r, r s , a ay a s ally a o a y o rol o r a lar r r s , o s ro a l y a s o r .

o, a o o r s ay lo . or a l , s ay l - s o l s, oy ss r s s as or ora s, a ay oo o a r o r or ora o s. o s ly, r ll a loa os s, a ro s a s o r s ll o a or o rs. a y or ora o s a a r ss r al a ro l y ro a s s a al ar o ay as s ar s o o a s' s o . a s o al r s o s or los ly os o roa r or ora o rs. y rs ro s a s ar r s roa r o - rs s a r o o . (*Key Question 2*)

QUICK REVIEW

- A plant is a physical establishment that contributes to the production of goods and services; a firm is a business organization that owns and operates plants; plants may be arranged horizontally, be vertically integrated, or take on a conglomerate form.
- The three basic legal forms of business are the sole proprietorship, the partnership, and the corporation. While sole proprietorships make up nearly three-fourths of all firms, corporations account for about nine-tenths of total sales.
- The major advantages of corporations are their ability to raise financial capital, the limited liability they bestow on owners, and their continuing life beyond the life of their owners and managers.
- The principal–agent problem is the conflict of interest that can occur when agents (executives) pursue their own objectives to the detriment of the principals' (stockholders') goals.

ECONOMIC COSTS

Opportunity Cost

ECONOMIC (OPPORTUNITY) COST A payment that must be made to obtain and retain the services of a resource; the income a firm must provide to a resource supplier to attract the resource away from an alternative use; equal to the quantity of other products that cannot be produced when resources are instead used to make a particular product.

os s s a s r so r s ar s ar a a al r a s s. so y s s a o a o o r so r s o ro a ar lar ro , or o s all al r- a o or s o s os r so r s or a y o r r os . as r o **economic cost** or **opportunity cost** o a y r so r s o ro a oo s al or or o l a s s al r a s .

s r ss s o o r a alys s o ro o oss l s a r 2, r o a o or y os o ro or as s s r al ro o s a s or o . larly, o or y os o s l s o - s r o l s s al o l a a a r a o o l s or r r ra ors. a r s or r o o s oo s s o a a la l or r y lo as or ro a o ls. a ass ly l or r s a a- l o ass l r rso al o rs or as a s, os o so y o loy a or r a o r la s o r o a or r o l o r s a a ro as a s.

Explicit and Implicit Costs

o l 's o s r oss ro r 's o . o or y os s , a say a *economic co a e he a men a m m make, o he income i m o ide, o a ac he e o ce i need a a f om al e na i e od c ion o o - ni ie .* os ay s o r so r s l rs ar l (r al a r ss) or l (r s o o o s). o, ro ro s r s r *e lici co a im lici co*

EXPLICIT COSTS The monetary payments a firm must make to an outsider to obtain a resource.

IMPLICIT COSTS The monetary income a firm sacrifices when it uses a resource it owns rather than supplying the resource in the market; equal to what the resource could have earned in the best-paying alternative employment (includes a normal profit).

- r 's **explicit costs** ar o ary ay s (or as r s) a s o os o s ly la o r s r s, a r als, l, ra s or a o s r s, a l . o y ay s ar or s o r so r s o yo rs.
- r 's **implicit costs** ar o or y os s o s s s l -o , s l - loy r so r s. o r , l os s ar o y ay s a s l - loy r so r s o l a ar r s al r a s .

or a l , s os yo ar ar $22,000 a y ar as a sal s r r s a or a -s r a a r r. so o yo o o ar a l s or o yo r o o s ll -s r s. o s $20,000 o sa s a as ar yo $1000 r y ar. o a yo r r ll o y a s all s or a yo o a a r o or $ 000 r y ar. o r o l r o l yo s or , ay- r $1 ,000.

y ar a r yo o s or , yo o al yo r a o s a ollo

Total sales revenue		$120,000
Cost of T-shirts	$40,000	
Clerk's salary	18,000	
Utilities	5,000	
Total (explicit) costs		63,000
Accounting profit		57,000

oo s oo . or a ly yo r a o ro o $,000 or s yo r l os s a s o rs a s o o s ss o yo r r . y ro - yo r o a al a al, l , a la o r, yo r l os s (or- o o s) o $1000 o r s , $ 000 o r , a $22,000 o a s. , yo r r r r al al s or , say, $ 000 a ally o r s ss a o rs o s lar s o , yo a also or a l os . o

Accounting profit		$57,000
Forgone interest	$ 1,000	
Forgone rent	5,000	
Forgone wages	22,000	
Forgone entrepreneurial income	5,000	
Total implicit costs		33,000
Economic profit		24,000

NORMAL PROFIT Payment that must be made by a firm to obtain and retain entrepreneurial ability; the minimum payment entrepreneurial ability must receive to induce it to perform the entrepreneurial functions for a firm; an implicit cost.

Normal Profit as a Cost

$ 000 l os o yo r r r r al al a o a l s a **normal profit**. s s r o or o r a or o a s, ay yo o l o r s r or r or r r r al o s s a l os . yo o r al a l as s , or or al, ay or yo r or , yo o l ra ro s l o s ss a s o a or a ra a o r. o a or al ro s a os o o s ss.

The economi incl de a co of od c ion all he co e lici and im lici , incl ding a no mal o e i ed o a ac and e ain e o ce in a eci c line of od c ion. or o o s s, a r 's o o os s ar o or y os s o r so r s s , r os r so r s ar o y o rs or y r . o r a l , o o os s ar $,000 ($,000 o l os s + $,000 o l os s).

Economic Profit (or Pure Profit)

ECONOMIC PROFIT The total revenue of a firm less its economic costs (which includes both explicit costs and implicit costs); also called pure profit and above normal profit.

o sly, , o o s s s r ro r ly ro ay a o - a s s . o a o a , ro s r 's o al r l ss s l os s (or a o os s). o o o s , **economic profit** s o al r l ss o- o os s (l a l os s, la r l a or al ro o r r r). o, a o o s says a r a r s ar o ly o r o o r s os s, s a s s all l a l os s a r r r s r a ay s lar o or a s or r al s r s l o ro o .

a r 's o al r s all s o o os s (l + l), a y r s al o s o r r r. a r s al s all a *economic*, or *e*, *o* . s or

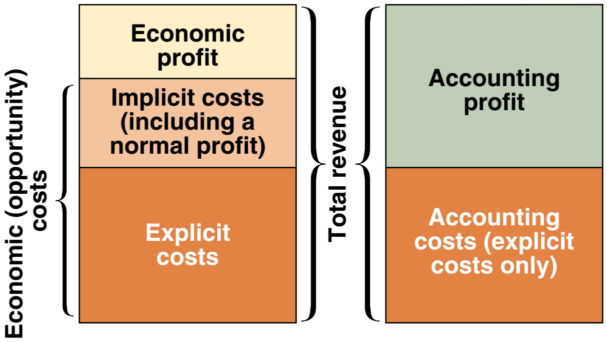
o o ro o al r o o os

o r a l , o o ro s $2 ,000, o y s ra $,000 o o- o os ro $120,000 o r . *economic* ro s o a os , a s s a r r ss o or al ro a s r r o r a r r r s ar lar l o ro o . o o ro s ro, r - r r s s ll o r all l a l os s, l a or al ro . o r a l , as lo as a o ro s $,000 or or (so a o o ro s ro or or), yo ll ar a $ 000 or al ro a ll, r or , o - o o ra yo r -s r s or .

r -1 s o s r la o s a o ar o s os a ro o s a a s s ss . o s yo rs l , yo a o r os a a ro o r a l a ro r a lo s. (***Key Question 4***)

FIGURE 8-1

Economic profit is equal to total revenue less economic costs. Economic costs are the sum of explicit and implicit costs and include a normal profit to the entrepreneur. Accounting profit is equal to total revenue less accounting (explicit) costs.


Economic profit
Implicit costs (including a normal profit)
Explicit costs
Economic (opportunity) costs
Total revenue
Accounting profit
Accounting costs (explicit costs only)

Short Run and Long Run

a or a r 's ro a s, r 's ro a l y ay o o ly a a s a o so ar o s r so r s loys. a as ly a ly a s a s loy o a y r so r ss as o rly la o r, ra a r als, l, a o r. s or , o r, o a s s *lan ca aci* s o a ory l , a o o a ry a , a o r a al r so r s. so a y s r s s as a r ra a a r a r ay s ral y ars o al r la a a y. a s o s r s a s , o o s s s l o s s o o al r o s s or r a lo r . ll s o r a os s r s o r o s.

<www.vanderbilt.edu/owen/froeb/mgt722/topics/cost/cost.html> Cost and production: short run and long run

SHORT RUN: FIXED PLANT

SHORT RUN A period of time in which producers are able to change the quantities of some but not all of the resources they employ.

short run s a r o oo r or a r o al r s la a a y y lo o o r a a r o la s s . r 's la a a y s s or r . o r, r a ary s o y a ly lar r or s all r a o s o la o r, a r als, a o r r so r s o a la . a s s s la a a y or or l ss s ly s or r .

LONG RUN: VARIABLE PLANT

LONG RUN A period of time long enough to enable producers of a product to change the quantities of all the resources they employ.

or a s r , **long run** s a r o lo o or o a s a - s o all r so r s a loys, l la a a y. or s ry, lo r also l s o or s r s o ssol a l a s ry or or r s o r a a r s ry. l s or r s a - la r o , lo r s a ar a l - la r o .

ILLUSTRATIONS

o ar r r s 100 ra or rs or o o s - oo la s or a s a r s o or rs, ar s a o s or r . a s a ro o a l- y a s alls or , ar r rr o lo r . rs s a o s a *ho - n adj men* s o s a *long- n adj men* .

s or r a lo r ar o al r o s ra r a al ar r- o s. l - a a r s r s, a s la a a y ay a o - l s al os o r . s all -s r a a r r a r as s la a a y a a r o ays y or r a s all o or r a l s a s ral ra s a s. or a y s ry lo r s a r a- r. ro- a a a ay r r s ral y ars o o s r a o l r ry.

QUICK REVIEW

- Explicit costs are money payments a firm makes to outside suppliers of resources; implicit costs are the opportunity costs associated with a firm's use of resources its owns.
- Normal profit is the implicit cost of entrepreneurship. Economic profit is total revenue less all explicit and implicit costs, including normal profit.
- In the short run, a firm's plant capacity is fixed; in the long run, a firm can vary its plant size and firms can enter or leave the industry.

SHORT-RUN PRODUCTION RELATIONSHIPS

r 's os s o ro a s o o r s o r so r s a a s o r so r s (s) o ro a o . so r s ly a a r r so r r s. olo al as s o ro o , s ally r la o s s s a o , r a s o r so r s . r o s ll o *labo* -o r la o - s , a - la a a y. or a a r la o s , o r r s

TOTAL PRODUCT (TP) The total output of a particular good or service produced by a firm (or a group of firms or the entire economy).

MARGINAL PRODUCT (MP) The extra output or added product associated with adding a unit of a variable resource to the production process.

AVERAGE PRODUCT (AP) The total output produced per unit of a resource employed (total product divided by the quantity of that employed resource).

LAW OF DIMINISHING RETURNS As successive increments of a variable resource are added to a fixed resources, the marginal product of the variable resource will eventually decrease.

1. **Total product (TP)** s o al a y, or o al o , o a ar lar oo ro .
2. **Marginal product (MP)** s ra o or a ro asso a a a o ar a l r so r , s as la o r, o ro o ro ss. s,

$$\text{ar al ro} = \frac{\text{a o al ro}}{\text{a la o r}}$$

. **Average product (AP)**, also all la o r ro y, s o r o la o r

$$\text{ra ro} = \frac{\text{o al ro}}{\text{s o la o r}}$$

s or r , a r a or a r as s o y a s o la o r o s la . y o ll o r s a r a s la o r y o say or a

Law of Diminishing Returns

a s rs ar ro ral r s y **law of diminishing returns**, also all *la of dimini hing ma ginal od c .* s la ass s a olo y s , so a s o ro o o o a . s a s a as *cce i e ni of a a iable e o ce (a , labo) a e added o a ed e o ce (a , ca i al o land), be ond ome oin he e a, o ma ginal, od c ha can be a ib ed o each addi ional ni of he a iable e o ce ill decline.* or a l , a o al or rs ar r o or a o s a a o o a al , o ll ally r s y s all r a s all r a o s as or or rs ar r .

RATIONALE

os a ar r as a r so r o 0 ar s la or . ar r o s o l a or l s (l ar s) a all, y l ll 0 s ls r ar . l a s la o , o ay r s o 0 s ls r ar . s o l a o ay r as o o s ls r ar , a r o 1, a a o r o . l a o s o l a l ss a l ss o la 's y l . s r o so, orl 's or or o l l ll y r ly s l a o o s s l 0- ar lo o la . , s r r s o o r, orl o l o o a o r o . y o s a or s , r l r, a ar s rs!

la o s r r s also ol s r o a r l ral s r s. ss a oo s o s a a r r r ra s. as a s a o o s as la s, la rs, sa s, a sa rs. s s o r s o or o or rs, o al o a ro y (o r or r) o l ry lo .

Choosing a Little More or Less

or rs o l a o r or a y r o s, a a a a s o s -
al a o o l o r al . o l los s ro o o o
a o r, a a s o l s a l o . s or, la o l
rs a , a ro o o l a s r o l oo
a al r la o a o o la o r.
s o o l l a os l s y r or or rs.
o l or lly s , a or rs o l s al o a s -
l o . o l o lo r los s ro o o o . s or or rs
r a , ro o o l o or a ar al ro o
a s or r o l r s .

<www.kanga.nu/~claw/docs/extess/> Find out whether free software production in a bazaar obeys the law of diminishing returns

r s o l o oo ly. s ll or or rs r a , yo
a r a o , o r ro o l s . or rs o l a o a
l o s a ry, o l r s . o al o o l r as a
a s ra , a s , s o la , a or r o l
a l ss a al o or as or a or la o r as r .
ar al ro o a o al or rs o l l a s r o l or
la o r ro or o o a o o a al. ally, a s ll or
or rs o l a s so o s o a ar al ro o l o -
a a o al ro o l l . r , a o o or a or
la o r o l a s all s a roo , a o al ro o l all o ro.
o a la o s r r s ass s a all s o la o r ar o al
al y. a s ss or r s r s o a sa a a l y, o or
oor a o , a o , ra , a or r . ar al ro l a ly
s s, o a s s ss or rs ar al a ly r or a s
or or rs ar s r la o a o o la a a a la l .

TABULAR EXAMPLE

a l -1 s a r al ll s ra o o la o s r r s. ol 2
s o s o al ro , or o al o , r s l ro o a l l o a
ar a l (la o r) ol 1 a a o o a al.

TABLE 8-1 TOTAL, MARGINAL, AND AVERAGE PRODUCT: THE LAW OF DIMINISHING RETURNS

(1) Units of the variable resource (labour)	(2) Total product (TP)	(3) Marginal product (MP), change in (2)/change in (1)		(4) Average product (AP), (2)/(1)
0	0			—
1	10	10	Increasing marginal returns	10.00
2	25	15		12.50
3	45	20		15.00
4	60	15	Diminishing marginal returns	15.00
5	70	10		14.00
6	75	5		12.50
7	75	0	Negative marginal returns	10.71
8	70	−5		8.75

ol s o s ar al ro ( ), a o al ro asso - a a a o al o la o r. o a o la o r , o al ro - s ro a la o or rs ll ro o o . rs r s o la o r r r as ar al r r s, ar al ro s o 10, 1 , a 20 s, r s ly. o r o la o r, ar al ro s s o ally, o ro s o la o r a a .

ra ro , or o r la o r , s s o ol . s al la y o al ro (ol 2) y r o la o r s o ro- (ol 1). s o la o r, or a l , s 1 (0/).

GRAPHICAL PORTRAYAL

igure 8-2 (**ey Graph**) s o s s r r s a a a l -1 ra ally a r r lar s r la o s s o al, ar al, a a ra ro - s. (ar al ro r -2( ) s lo al ay s o la o r, s a l s o a o o a la o r .)

o rs r -2(a) a o al ro , , o s ro r as s r s s ally a a r as ra r as s, a a s ra ally, a r r a a a , l s.

G o r ally, ar al ro s o y r r -2( ) s slo o o al ro r . ar al ro as r s a o al ro asso a a s o la o r. s, r as s o o al ro ar also r ar al ro . r o al ro s r as- a a r as ra , ar al ro s r s . r , ra s o la o r ar a lar r a lar r a o s o o al ro . larly, r o al ro s r as a a r as ra , ar al ro s os all . a a o al o la o r a s l ss o o al ro a r o s . o al ro s a a a , ar al ro s ro. o al ro l s, ar al ro o s a .

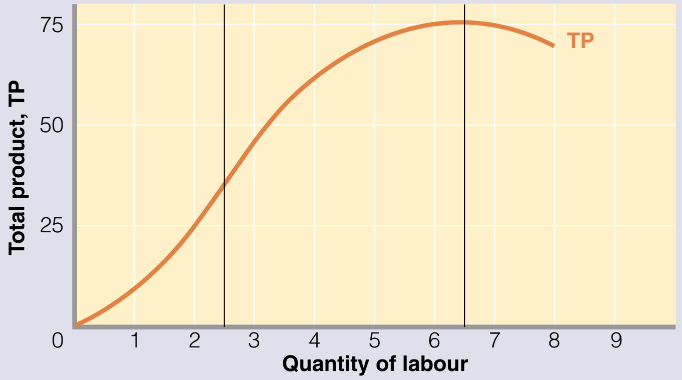
ra ro , r -2( ), s lays sa s as ar al ro . r as s, r a s a a , a r as s as or s o la o r ar a o la . o r la o s ar al ro - a a ra ro r ar al ro s a ra ro , a r- a ro r s s, a r ar al ro s l ss a a ra ro , a ra ro l s. ollo s a ar al ro rs s a ra ro r a ra ro s a a a .

s r la o s s a a a al ss y. yo a a lar r r o a o al a rr a ra o a o al, a ra s r s yo a a s all r r o a o al a rr a ra o a o al, a ra s all. o ra s yo r a ra a a o ra o ly yo r s or o a a o al (ar- al) a a o s r a r a a ra o all yo r as s or s. o lo r yo r a ra yo r ra o a a o al a s lo yo r rr a r- a . o r ro o a l , a o a ra or r a s o o al ro s a ra ro o all or rs rr ly loy , a ra ro ll r s . o rs ly, a ra or r a s o o al ro a a o a s l ss a rr a ra ro , a ra ro ll r as .

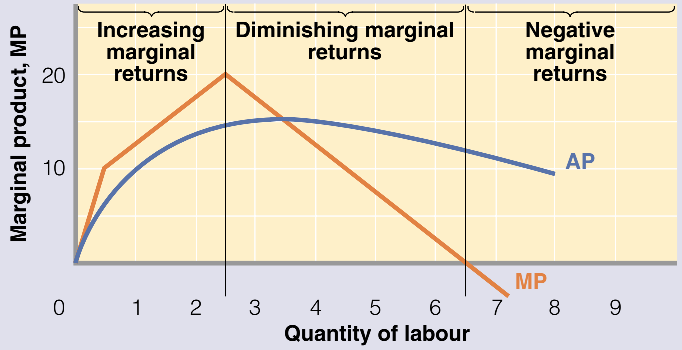
la o s r r s s o s a s o all r r s. , as o r o o la o s r r s a s, o o s s ar os o r s s o ar al ro . r o s o r as , - s , a a ar al ro (r r s) ar s o r -2( ). (*Key Question 6*)

Key Graph FIGURE 8-2 THE LAW OF DIMINISHING RETURNS

Panel (a): As a variable resource (labour) is added to fixed amounts of other resources (land or capital), the total product that results will eventually increase by diminishing amounts, reach a maximum, and then decline. Panel (b): Marginal product is the change in total product associated with each new unit of labour. Average product is simply output per labour unit. Note that marginal product intersects average product at the maximum average product.



(a) Total product



(b) Marginal and average product

QUICK QUIZ

1. Which of the following is an assumption underlying these figures?
   a. Firms first hire highly skilled workers and then hire less skilled workers.
   b. Capital and labour are both variable, but labour increases more rapidly than capital.
   c. Consumers will buy all the output (total product) produced.
   d. Workers are of equal quality.

2. Marginal product is
   a. the change in total product divided by the change in the quantity of labour.
   b. total product divided by the quantity of labour.
   c. always positive.
   d. unrelated to total product.

3. Marginal product in graph (b) is zero when
   a. average product in graph (b) stops rising.
   b. the slope of the marginal-product curve in graph (b) is zero.
   c. total product in graph (a) begins to rise at a diminishing rate.
   d. the slope of the total-product curve in graph (a) is zero.

4. Average product in graph (b)
   a. rises when it is less than marginal product.
   b. is the change in total product divided by the change in the quantity of labour.
   c. can never exceed marginal product.
   d. falls whenever total product in graph (a) rises at a diminishing rate.

Answers

1. d; 2. a; 3. d; 4. a

SHORT-RUN PRODUCTION COSTS

ro o or a o s as a ro a l -1 a r -2(a) a ( ) s o l r so r r s o r o al a r- os s o ro ar o s l ls o o . o a s or r so r so r s, os asso a r 's la , ar . rs r so r , o r, ar ar - a l . o s or -r os s ar r or ar a l .

Fixed, Variable, and Total Cost

's s a s s s os s, ar a l os s, a o al os s ro o a o r.

FIXED COSTS

FIXED COSTS Costs that in total do not change when the firm changes its output; the costs of fixed resources.

ixed costs ar *ho e co ha in o al do no a i h change in o* . os s ar asso a ry s o a r 's la a , r or , s a s o s ro. os s as r al ay s, r s o a r 's s, a or o o r a o o a l s, a s ra r s ar rally os s y o o r as a r ro s or . ol 2 a l -2 ass a r 's o al os s $100. y o , s os s rr a all l ls o o , l ro. r a o a o ay s os s s or r .

VARIABLE COSTS

VARIABLE COSTS Costs that in total increase when the firm increases its output and decrease when it reduces its output.

Variable costs ar *ho e co ha change i h he le el of o* . y l ay- s or a r als, l, o r, ra s or a o s r s, os la o r, a s lar ar a l r so r s. ol o a l -2 a o al o ar a l os s a s r ly o , o a r as s ar a l os asso a s o - r as s o ar o al. s ro o s, ar a l os ll or a r as y a r as a o s s r ro o r o o a l -2. yo o r , o r, ar a l os r s s y r as a o s or s s o o . r aso l s s a o ar al ro r . rs , as r -2( ), ar al ro s r as , so s all r a s all r r as s a o s o ar a l r so r s ar o ro s ss s o o . ar a l os o s ss s o o r as s. , as - s r r s ar o r , ar al ro s o l , lar r a lar r a o al a o s o ar a l r so r s ar o ro s ss s o o . o al ar a l os , r or , r as s y r as a o s.

TOTAL COST

TOTAL COST The sum of fixed cost and variable cost.

Total cost *i he m of ed co and a iable co a each le el of o* . s s o ol a l -2. ro s o o , o al os s al o r 's os . or a o 10 s o ro o , o al os r as s y sa a o as ar a l os .

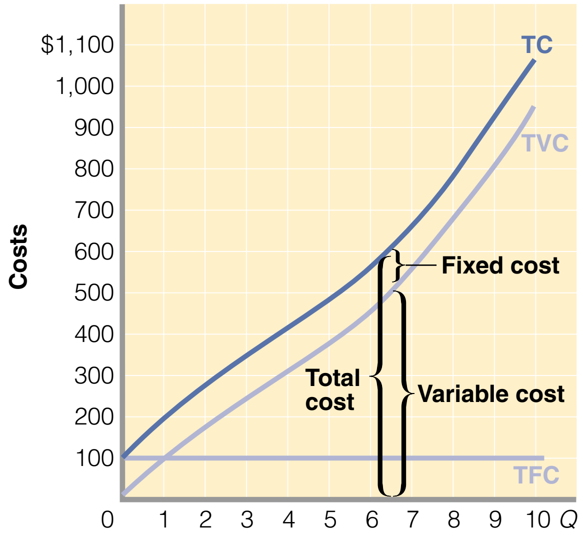
r - s o s ra ally - os , ar a l - os , a o al- os a a a l -2. s r a o al ar a l os , , s as r r ally ro or o al a s a a l l o o . a o o os , s o as , s a r ally o o al ar a l os r o o a o s o o al- os r , .

TABLE 8-2 TOTAL-COST, AVERAGE-COST, AND MARGINAL-COST SCHEDULES FOR AN INDIVIDUAL FIRM IN THE SHORT RUN

TOTAL-COST DATA				AVERAGE-COST DATA			MARGINAL COST
(1) Total product (*Q*)	(2) Total fixed cost (TFC)	(3) Total variable cost (TVC)	(4) Total cost (TC)	(5) Average fixed cost (AFC)	(6) Average variable cost (AVC)	(7) Average total cost (ATC)	(8) Marginal cost (MC)
			TC = TFC + TVC	$AFC = \frac{TFC}{Q}$	$AVC = \frac{TVC}{Q}$	$ATC = \frac{TC}{Q}$	$MC = \frac{\text{change in TC}}{\text{change in } Q}$
0	$100	$ 0	$ 100				
1	100	90	190	$100.00	$90.00	$190.00	$ 90
2	100	170	270	50.00	85.00	135.00	80
3	100	240	340	33.33	80.00	113.33	70
4	100	300	400	25.00	75.00	100.00	60
5	100	370	470	20.00	74.00	94.00	70
6	100	450	550	16.67	75.00	91.67	80
7	100	540	640	14.29	77.14	91.43	90
8	100	650	750	12.50	81.25	93.75	110
9	100	780	880	11.11	86.67	97.78	130
10	100	930	1030	10.00	93.00	103.00	150

FIGURE 8-3

Total variable cost (TVC) changes with output. Total fixed cost (TFC) is independent of the level of output. The total cost (TC) at any output is the vertical sum of the fixed cost and variable cost at that output.



s o a ar a l os s s s a o s ss a a r. ar a l os s a o roll or al r s or r y a ro o l ls. os s ar yo s ss a a r's rr o rol y ar rr s or r a s a r ar l ss o o l l.

Per-Unit, or Average, Costs

ro rs ar r a ly r s r o al os s, y ar ally o r r- , or a ra , os s. ar lar, a ra - os a a ar or a - l or a o ar so s ro r , s al ays s a o a r- as s. ra os , a ra ar a l os , a a ra o al os ar s o ol s o , a l -2.

AFC

AVERAGE FIXED COST (AFC) A firm's total fixed cost divided by output (the quantity of product produced).

Average fixed cost (A C) or a y o l l s o y o al os ( ) y a o (Q). a s,

$$\frac{\quad}{Q}$$

a s o al os s, y o , sa r ar l ss o o , s l as o r as s. s o r s s, o al os s s r a o r a lar r a lar r o . o s s o a l -2, a ar sa a $100. a o s o o , o al os o $100 o s $ 0 o or os r o s $. r as $100 s s r a o r r s, a $2 r s r a o r o r s. s ro ss s so - s r rr o as s r a o r a . r - s o s a ra s as a o o sly l r as o al o s r as .

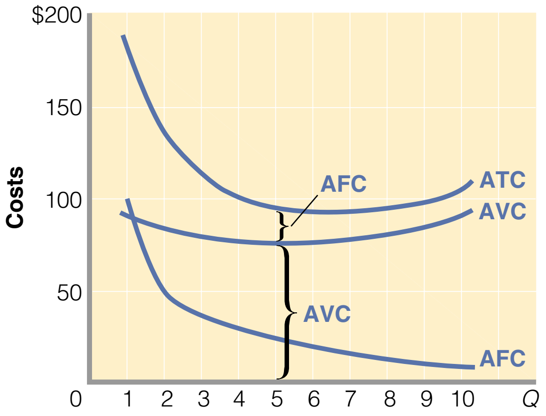
AVC

AVERAGE VARIABLE COST (AVC) A firm's total variable cost divided by output (the quantity of product produced).

Average variable cost (AVC) or a y o l l s al la y o al ar a l os ( ) y a o (Q)

$$\frac{\quad}{Q}$$

FIGURE 8-4



AFC falls as a given amount of fixed costs is apportioned over a larger and larger output. AVC initially falls because of increasing marginal returns but then rises because of diminishing marginal returns. Average total cost (ATC) is the vertical sum of average variable cost (AVC) and average fixed cost (AFC).

s a ar a l r so r s r as o , l s ally, r a s a , a r as s a a . ra o s a -s a or sa r-s a r , as s o r - .

a s o al ar a l os r s la o s r r s, so s , s r ro o al ar a l os . a s ar al r r s r as ally, a s r a r a o al ar a l r so r s o ro a o rs o r so o . s ar s l, ar a l os r l s. s a o o , a yo a o r s s as s r r s r r or ar a l r so r s o ro a a o al o o . s l r r s, a ry lo l ls o o , ro o s r la ly a os ly. a s r 's la s rs a , a ra ar a l os s r l-a ly . s o a s, o r, r a r s al a o a r s o r 's a al y l or y, a ar a l os r o o -l s. s s ll or ar a l r so r s ar a , a o s r a s r r s ar rr . r 's a al s o s a or s ly, a , r or , a a o s o r as o y as as r s, a s a ally r as s.

o a r y or sa r s a o r y r r o a l -1. ss r o la o r s $10 r . y a ra ro (o r la o r) o $10 (r r la o r), r la o r os r o o . a s a ass la o r o o ly ar a l , la o r os r o o s ar a l os r o o or . a ra ro s ally lo , s . s or rs ar a , a ra ro r s s a alls. a ra ro s a s a , s a s . , as s ll or or rs ar a a a ra ro l s, r s s. o a ra - ro r s r sa r or s a o r . s yo ll soo s , o ar rror a s.

AVERAGE TOTAL COST (ATC) A firm's total cost divided by output (the quantity of product produced); equal to average fixed cost plus average variable cost.

ATC

Average total cost (ATC) or a y o l l s o y o al os ( ) y a o (Q) or y a a a a o

$$\frac{\quad}{Q} \qquad \frac{\quad}{Q} + \frac{\quad}{Q} \qquad +$$

Choosing a Little More or Less

Gra ally, a o y a r ally a r s, as r - . s, r al s a a r s as r s a a y l l o o .

Marginal Cost

MARGINAL COST (MC) The extra or additional cost of producing one more unit of output equal to the change in total cost divided by the change in output (and in the short run to the change in total variable cost divided by the change in output).

al a ry r al os o r a s **Marginal cost (MC)** *i he e a, o addi ional, co of od cing one mo e ni of o* . a r or a a o o y o a o al os a a 's ro o a ls

$$\frac{a}{a \qquad Q}$$

CALCULATIONS

ol , a l -2 o a 1 , ro o o rs o o r as s o al os ro $100 o $1 0. r or , a o al, or ar al, os o a rs s $ 0 (ol). ar al os o s o s $ 0 ($2 0 $1 0) o r s $ 0 ($ 0 $2 0) a so or . or a o 10 s o o s s o ol .

a also al la ro o al- ar a l - os ol , a s o ly r o al os a o al ar a l os s o s a a o o os s ($100). s, a o al os a a o al ar a l os asso- a a a o al o o ar al ays sa .

MARGINAL DECISIONS

ar al os s ar os s r a o rol r ly a a ly. ally, s a s all a o al os rr ro las o o . s, also s a s os a a sa y o ro a las . ra - os r s o o ro s or a o . or a l , s os r s r o ro r or o r s o o . o r s a l -2 a s a s $100. r o s o r as s o al os s y $100 y ro o r , or o s sa $100 y o ro a . a r, a os s ol r s o ly $ 0, as ol a l -2 r als. r 's s o s as o a o l l o ro ar y ally ar al - s o s, a s, s o s o ro a or or a l ss s. ar al os s a os s o or or o r o o s ro . o l ar al r (, as yo ll s a r , a s a r ro o or or o r o o), ar al os allo s a r o r r s ro a l o a or o ra s ro o . a alys s r a rs o s s o os ar al al la o s.

GRAPHICAL PORTRAYAL

ar al os s s o ra ally **igure 8-5** (**ey Graph**). ar al os a rs l s s ar ly, r a s a , a r s s ra r a r ly. s a r r s a a ar a l os s, a r or o al os , r as rs y r as- a o s a y r as a o s (s ol s a , a l -2).

MC AND MARGINAL PRODUCT

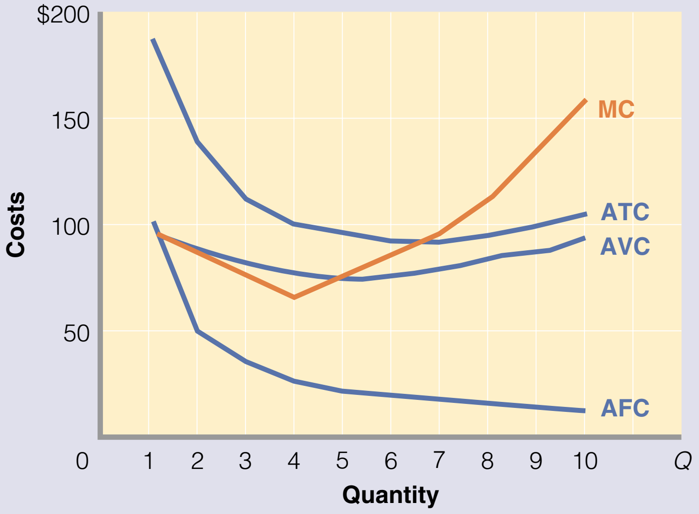
s a o ar al- os r s a o s o la o s r r s. oo a a a l -1, a s r la o s ar al ro a ar al os . all s o a ar a l r so r (r la o r) ar r a sa r , ar al os o a ra o o ll all as lo as ar al ro o a a o al or r s r s , a s ar al os s (o s a) os o a ra or r y s or r ar al ro . r - or , a l -1, s os a a or r a r or $10. a s rs or r's ar al ro s 10 s o o , a r s or r r as s r 's os s y $10, ar al os o a o s 10 ra s o o s $1 ($10 10 s). s o or r also r as s os s y $10, ar al ro s 1 , so ar al os o a o s 1 ra s o o s $. ($10 1 s). larly, o a o 20 ra s o o o - r y r or r s $. 0 ($10 20 s). o ral , as lo as ar- al ro s r s , ar al os ll all.

o r or r, s r r s s a ar al os s o r s . or o r or r, ar al os s $. ($10 1 s) or or r, s $1.00 ($10 10 s) or s , s $2,00 ($10 s), a so o . r (os) o ar a l r so r r a s o s a , r as ar- al r r s ll r a l ar al os , a s ar al

Key Graph

FIGURE 8-5 THE RELATIONSHIP OF THE MARGINAL-COST CURVE TO THE AVERAGE-TOTAL-COST AND AVERAGE-VARIABLE-COST CURVES

The marginal-cost (MC) curve cuts through the average-total-cost (ATC) curve and the average-variable-cost (AVC) curve at their minimum points. When MC is below average total cost, ATC falls; when MC is above average total cost, ATC rises. Similarly, when MC is below average variable cost, AVC falls; when MC is above average variable cost, AVC rises.



QUICK QUIZ

1. The marginal-cost curve first declines and then increases because of
- a. increasing, then diminishing, marginal utility.
- b. the decline in the gap between ATC and AVC as output expands.
- c. increasing, then diminishing, marginal returns.
- d. constant marginal revenue.

2. The vertical distance between ATC and AVC measures
- a. marginal cost.
- b. total fixed cost.
- c. average fixed cost.
- d. economic profit per unit.

3. ATC is
- a. AVC – AFC.
- b. MC + AVC.
- c. AFC + AVC.
- d. (AFC + AVC) × *Q*.

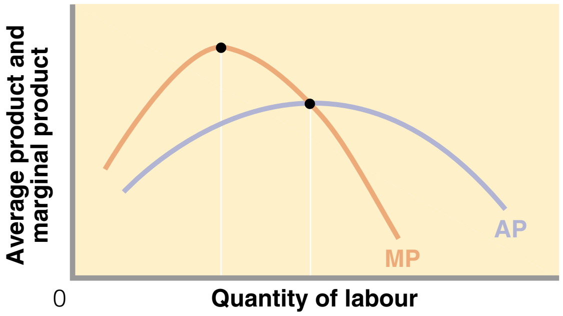
4. When the marginal-cost curve lies
- a. above the ATC curve, ATC rises.
- b. above the AVC curve, ATC rises.
- c. below the AVC curve, total fixed cost increases.
- d. below the ATC curve, total fixed cost falls.

Answers

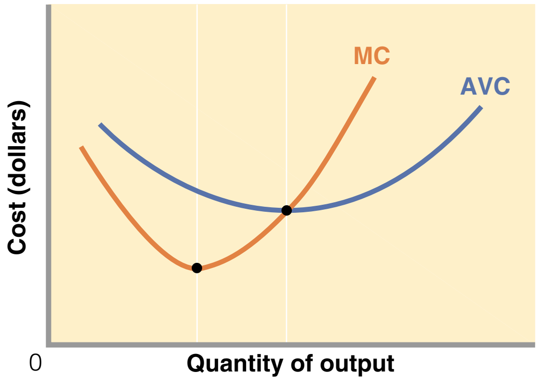
1. c; 2. c; 3. c; 4. a

FIGURE 8-6 THE RELATIONSHIP BETWEEN PRODUCTIVITY CURVES AND COST CURVES

The marginal-cost (MC) curve and the average-variable-cost (AVC) curve in panel (b) are mirror images of the marginal-product (MP) and average-product (AP) curves in panel (a). Assuming that labour is the only variable input and that its price (the wage rate) is constant, then when MP is rising, MC is falling, and when MP is falling, MC is rising. Under the same assumptions, when AP is rising, AVC is falling, and when AP is falling, AVC is rising.



(a) Production curves



(b) Cost curves

r r s a r s ar al os . r s a rror r o o ar al-
ro r . s yo a s r - , ar al ro s r s ,
ar al os s ssar ly all . ar al ro s a s a , ar-
al os s a s ar al ro s all , ar al os s r s .

RELATION OF MC TO AVC AND ATC

r - s o s a ar al- os r rs s o a
r s a r o s. s o arl r, s ar al-a ra r la o s
s a a a al ss y, a s l ll s ra o ll r al. os a as -
all r as allo s o o s a a ra o r r s r a rs
r a s as . o , r s a ra alls or r s s as a r s l o
a o r (ar al) a ll o r a o al r s
allo s a ra a ar r or or a s rr r -r a ra .
o r a allo s r a r r s, or a l o , s o al r s ll
r s ro o 10 a s a ra ll all ro o 2. (10). o rs ly,
o r a allo s or a r r s, say, s , s o al ll r as
ro o 1 a s a ra ll r s ro o (1).
o s os s. a o (ar al os) a o o al os s l ss
a rr a ra o al os , ll all. o rs ly, ar al
os s , ll r s , a s a r - , as lo as l s
lo , ll all, a r l s a o , ll r s .

o o rs o , r als , as s s o all as o y rs . s o , y o , s o o r . ar al- os r rs s a ra - o al- os r a r ’s o .

ar al os a as a o r o o al os or o o al ar- a l os r s l ro o or o o s, s sa ra o al la s y r also ross s r a r ’s o . os r la o s s s r a a ra - - os r , a s o ar o r la ar al os l s o ly os os s a a o , a os s y o ar os a ar o o . (*Key Question 9*)

Shifts of Cost Curves

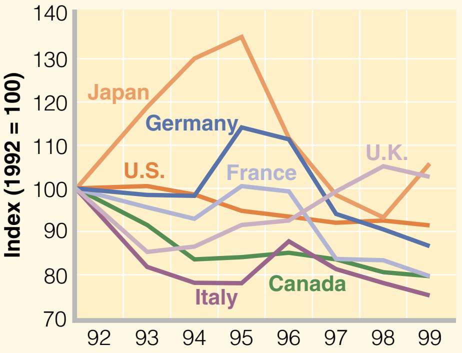
a s rr so r r s or olo y ll a s os s o a a r- or os r s o s . os s o l ro $100 o $200, r r - o l s ar . a l lo o , os s ar r. r o l also o ar , a s s a o o o . os o s o a r s o l al r , a s r lo a o s ar as o r s o ar a l ra r a r so r s. o r, r (a) o la o r or so o r ar a l ros , , , a o l r s , a os os r s o l all s ar . r o l r a la a s os s a o a . , o o rs , r o s r s o or ar a l r so r s o l r os s a ro s s o os r a ly o os o os s s r .

s o ry o a or olo y o l r as ro y o all s, a os r s a l -2 o l all lo r. o ll s ra , la o r s o ly ar a l , a s ar $10 r o r, a a ra ro s 10 s, o l $1. a olo al ro r as s a r- a ro o la o r o 20 s, ll l o $. 0. or rally, a ar s ro y r s s o r - (a) a s a o ar s os r s or ray r - ( ). (Glo al rs .1.)

GLOBAL PERSPECTIVE 8.1

Relative changes in average labour costs in manufacturing, 1992–1999, selected nations

Average labour costs (labour costs per unit of output) are a significant part of average total costs in most industries. Average labour costs have varied widely among nations at various times in recent years. Other things equal, higher average labour costs at each output level result in higher ATC curves; lower average labour costs result in lower ATC curves.



Source: U.S. Bureau of Labor Statistics, <www.bls.gov/>.

QUICK REVIEW

- The law of diminishing returns indicates that, beyond some point, output will increase by diminishing amounts as more units of a variable resource (labour) are added to a fixed resource (capital).
- In the short run, the total cost of any level of output is the sum of fixed and variable costs (TC = TFC + TVC).
- Average fixed, average variable, and average total costs are fixed, variable, and total costs per unit of output; marginal cost is the extra cost of producing one more unit of output.
- Average fixed cost declines continuously as output increases; average-variable-cost and average-total-costs curves are U-shaped, reflecting increasing and then diminishing returns; the marginal-cost curve falls but then rises, intersecting both the average-variable-cost-curve and the average-total-cost curve at their minimum points.

LONG-RUN PRODUCTION COSTS

<hadm.sph.sc.edu/Courses/Econ/Cost/Cost.html>
A tutorial on total cost, fixed cost, variable cost, and marginal cost

lo r a s ry a al r s o r s s a r a all s r r so r a s s. a s, y a a a o o all s s . r a al r s la a a y a l a lar r la or r r o a s all r la a a ass a l -2. s ry also a a s la s lo r allo s s or r s o r or or s r s o l a a s ry. ll s ss a o ry a o r s o a ro a s ry a r r ar o r o ly a s la a a y a y a s l r . ’s o o r a alys s r s o a ra o al os ( ), a o s o a ar a l os s a s all r so r s, a r or all os s, ar ar a l lo r .

Firm Size and Costs

os a s l - la a a r r s o a s all s al a , as r s l o s ss l o ra o s, a s o s ss ly lar r la s s lar r o a a s. a a s o a ra o al os as s o rs or a , s s- s ly lar r la s ll lo r a ra ra o al os . o r, ally l o a s ll lar r la ay a s o r s .

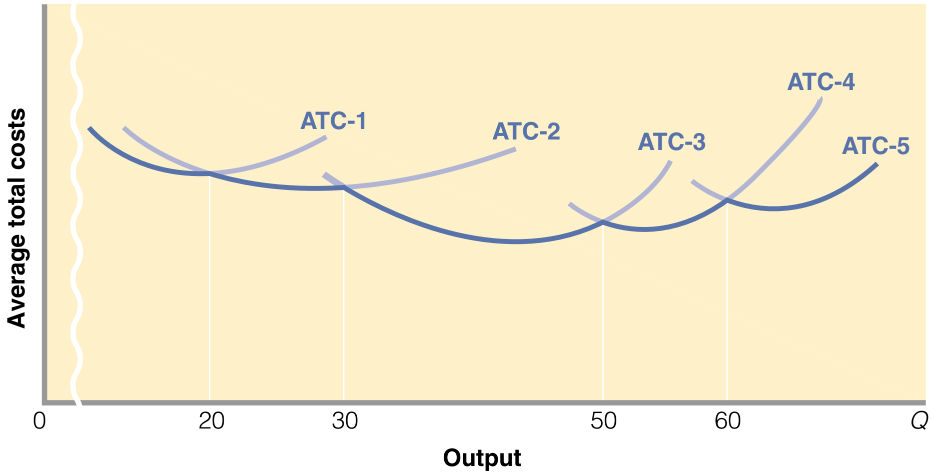
r - ll s ra s s s a o or oss l la s s. -1 s s or - r a ra - o al- os r or s all s o la s, a - r or lar s . o s r lar r la s ll lo r a ra o al os s ro la s , lar r la s ll a r a r- a o al os s.

The Long-Run Cost Curve

r al l s r lar o o a s r - a os o - s a r s o l a la s or al lo s a a a l a r- a o al os s o ro o . s ar o s a r- os s or a lar r la ro lo os or rr , s all r la . or all o s o 20 s, lo s a ra o al os s ar a a a l la s 1. o r, r ’s ol o sal s a s o 20 a 0 s, a a lo r r- os s y o s r lar r la s 2. l o o al os ll r a

FIGURE 8-7 THE LONG-RUN AVERAGE-TOTAL-COST CURVE: FIVE POSSIBLE PLANT SIZES

The long-run average-total-cost curve is made up of segments of the short-run cost curves (ATC-1, ATC-2, etc.) of the various-size plants from which the firm might choose. Each point on the planning curve shows the least unit cost attainable for any output when the firm has had time to make all desired changes in its plant size.



a l ls o ro o , os r o o ll l ss. or a y o 0 a 0 s, la s lly l lo s a ra o al os s. ro 0 o 0 s o o , r s l la s o a lo s os s. o s a ra o al os s or a y o o r 0 s r r o s r - o o s ll lar r la s .

ra s a s s, a lo -r r or r r s s a o s s o s or -r r s or ar o s la s s a a o s r . lo -r r s o s lo s a ra o al os a *an o* *le el* a ro a r r as a o a all a ror a a s s s la s . r - ar l , y r s r ’s lo -r r or, as s o all , r ’s *lanning c* *e.* os l s o ro o , o o la s s r a o r ll s ra o . a y s r s r o oss l la s s s r ally l , a s all a s ol o o ll l a o a s la s . Gra ally, s l s a l r o s or -r r s, o or a o l l, as s s y **igure 8-8** (**ey Graph**). , ra r a o s s o s s o s or -r r s as r - , lo -r r s a o all o s o a y o l r o s or -r r s ro lo -r r s r . r or , la r s s oo ra r a y. a o o lls s o ro orr s o l l o o .

Economies and Diseconomies of Scale

a ass a or a r as la s s ll l a o lo r os s a yo so o s ss ly lar r la s ll a r a ra o al os s. a s, a ass a lo -r r s -s a . y s o l s o , rs , a la o s r r s o s o a ly lo r a s s r r s r s s o r so r s s ly, l lo r a s all r so r s ar ar a l . lso, o r s ss o ass s r so r r s ar o s a . a la -s a lo -r a ra - o al- os r r s o o o s a s o o s o lar -s al ro o .

ECONOMIES OF SCALE

ECONOMIES OF SCALE Reductions in the average total cost of producing a product as the firm expands the size of plant (its output) in the long run; the economies of mass production.

Economies of scale, or o o s o ass ro o , la o slo ar o lo -r r . s la s r as s, a r o a ors ll or a l a o lo r a ra os s o ro o .

Labour Specialization r as s al a o s o la o r o s or a a l as a la r as s s . r or or rs a s o s a a s . a or r ay o a s o as o r or s a o ors s . or rs a or ll o os as s or y a s al s lls. a s all la , s ll a s s ay s al r r- or s ll as s, l a o r ro o os s.

r r, y or a r as s, or rs o ro a os as s. a -o -all- ra s o or s o s s o l ly o a y o . y o ra o o as , sa or r ay o ly .

ally, r a r la o r s al a o l a s loss o a a o a s a s o a or r ro o as o a o r.

Managerial Specialization ar -s al ro o also a s r s o , a r a r s al a o , a a . s r sor o a a l 20 or rs s r s a s all la a loys o ly 10 o l . ro o s a o l o l o r as s r sory os s.

all r s a o s a a s al s s o s a a a . a s all la sal s s al s s ay a o r s ral o s, or a l , ar , rso l, a a . lar r s al o o ra o s a s a ar r a s r s ar ll , l s al s s r or o r a a r al o s. Gr a r y a lo r os s ar r s l .

Efficient Capital all r s o a o a or os . a y l s o ro o s a ry s a a la l o ly ry lar a r ly s s. r r or , s o a s a ol o ro o , a a a a r r s lar -s al ro rs. a o o l s ry os a r a o o or r- a loys ro o s a la ora ass ly l . s o s a s a a al o o r a s 200,000 o 00,000 a o o l s. ly ry lar -s al ro rs a a or o r as a s s - ly. s all-s al ro r s a a l a. o a r a a o o l s s o r s a , r or , or os ly r . al r- a o r as a r s a lo l ls o o - s also a os ly.

Other Factors a y ro s a l s a lo os s, as ll as o r s ar - os s, a s rr rr s o ro sal s. s os s l r as o s r as . larly, a r s os s l r a o, r o r, r s r o sys , a r o o r as or s ar ro a sol . r 's ro o a ar r s s ally r s s as ro s a s lls or o . s *lea ning b doing* s a r r so r o o o s o s al . ll s a ors o r o lo r a ra o al os s or r a s a l o a s s al o o ra o s. r o o s o s al ar oss l , a r as all r so r s o , say, 10 r ll a s a or - a - ro or o a r as o - o , say, 20 r . r s l ll a l .

a y a a a a a r s r s, o o s o s al a o r a s a . r s a a a r s al o o ra o s o o a o o s o ass ro o a s r a o r s . os a l o a a o r la ly - os ro rs, oo os r l os r .

DISECONOMIES OF SCALE

a s o o a r ay l a o s o o s a , r or , r a ra o al os s.

DISECONOMIES OF SCALE Increases in the average total cost of producing a product as the firm expands the size of its plant (its output) in the long run.

a a or a s **diseconomies of scale** s l y o ly o - roll a oor a a r ’s o ra o s as o s a lar -s al ro r. a s all la a s l y ay a all as s o s or la ’s o ra o . a s o r ’s s all s , s los o ro- o l , rs a s r ’s o ra o s, a a s or a o a a s o s.

s a r a s as a r ro s. a y a a l ls o o s a ass ly l o a a s ar r o ro a al ro o o ra o s o la . rso a o ass l , s , a rs a all or a o ss al o s o a o a lar s al . or y s l a o a y - r s s, s o - r s s, a so or . s a s o o a a rar y l a s o ro l s o o a o a oo ra o , r a ra r a , a oss l y a s o s ll o oor a . larly, s o a ay slo o o o a s o s a l o r a s o s r as s or olo y ly o . r s l s a r y a r s a ra o al os s.

lso, ass ro o a l s or rs ay l al a ro r loy rs a ar l l a o or ly. or s o s r r s o - s l s, y a o or a o r o o - - o l s r , ay r a r lar la s a s all o s. o r or r al a o a s r ay r r a o al or r s r s o , r as s os s.

r s o o s o s al ar o ra , a r as all s o , say, 10 r ll a s a l ss- a - ro or o a r as o o , say, r . s a o s , ll r as . r s or o o lo -r os r s r - ll s ra s s o o s o s al .

CONSTANT RETURNS TO SCALE The range of output between the output at which economies of scale end and diseconomies of scale begin.

CONSTANT RETURNS TO SCALE

so s r s a ra r ra o o ay s o a o o s o s al a o a s o o s o s al . a s, a ra o **constant returns to scale** ay s o r lo -r a ra os o s o a . $_1$ $_2$ o ra o r - (a) s a a l . r a r a r as all s o , say, 10 r ll a s a ro or o a 10 r r as o . s, s ra s o s a .

<www.theshortrun.com/classroom/glossary/micro/costprofit.html> Cost and profit summarized, including constant returns to scale

Applications and Illustrations

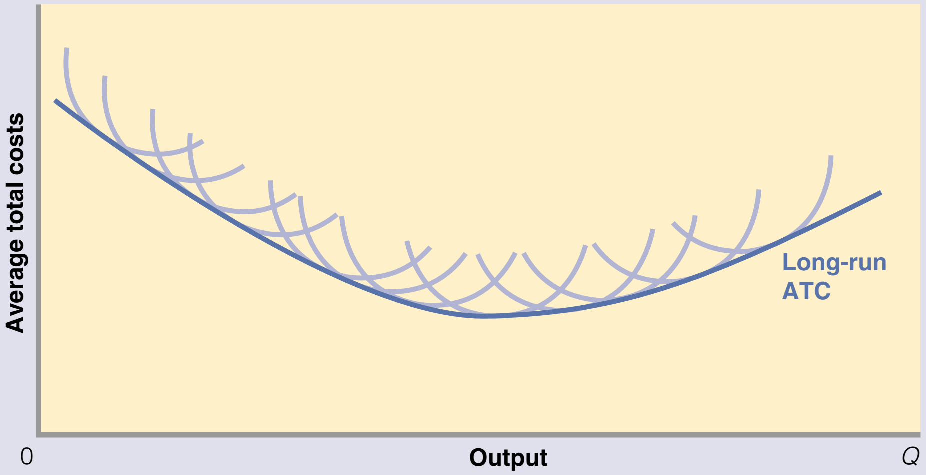
s ss orl o rs a y a l s o o o s a s o o s o s al . r ar s a .

SUCCESSFUL STARTUP FIRMS

a a a o o y as r a ly o r as a s y lo- s ro o s ar r s. r o o s o s al ar s a , s

Key Graph

FIGURE 8-8 THE LONG-RUN AVERAGE-TOTAL-COST CURVE: UNLIMITED NUMBER OF PLANT SIZES



If the number of possible plant sizes is very large, the long-run average-total-cost curve approximates a smooth curve. Economies of scale, followed by diseconomies of scale, cause the curve to be U-shaped.

QUICK QUIZ

1. The unlabelled tinted curves in this figure illustrate the

a. long-run average-total-cost curves of various firms constituting the industry.
b. short-run average-total-cost curves of various firms constituting the industry.
c. short-run average-total-cost curves of various plant sizes available to a particular firm.
d. short-run marginal-cost curves of various plant sizes available to a particular firm.

2. The unlabelled tinted curves in this figure derive their shapes from

a. decreasing, then increasing, short-run returns.
b. increasing, then decreasing, short-run returns.
c. economies, then diseconomies, of scale.
d. diseconomies, then economies, of scale.

3. The long-run ATC curve in this figure derives its shape from

a. decreasing, then increasing, short-run returns.
b. increasing, then decreasing, short-run returns.
c. economies, then diseconomies, of scale.
d. diseconomies, then economies, of scale.

4. The long-run ATC curve is often called the firm's

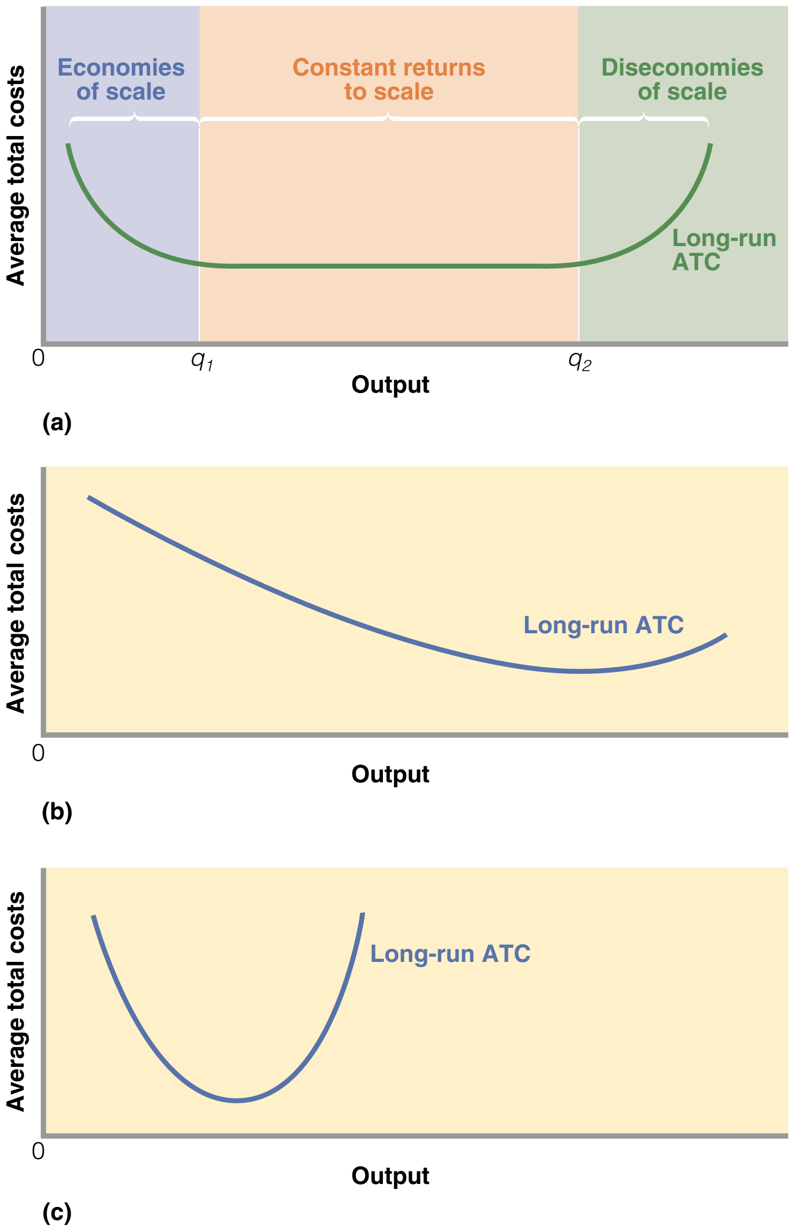
a. planning curve.
b. capital-expansion path.
c. total-product curve.
d. production possibilities curve.

Answers

1. c; 2. b; 3. c; 4. a

FIGURE 8-9 VARIOUS POSSIBLE LONG-RUN AVERAGE-TOTAL-COST CURVES

In panel (a), economies of scale are rather rapidly obtained as plant size rises, and diseconomies of scale are not encountered until a considerably large scale of output has been achieved. Thus, long-run average total cost is constant over a wide range of output. In panel (b), economies of scale are extensive, and diseconomies of scale occur only at very large outputs. Average total cost, therefore, declines over a broad range of output. In panel (c), economies of scale are exhausted quickly, followed immediately by diseconomies of scale. Minimum ATC thus occurs at a relatively low output.



r s a oy y ars or a s o ro a o a y lo r a ra o al os s. a as as or s r a o ally r o r s as l (ro s), ar s (o), allar o r ys s (l lls), roso (so - ar), l s a (o r o o s), ll (rso al o rs), a oo (r- s ar), s o ys s (r s), or l or s (r o s), ral r ss (o r l ry), a r a l (r a ss).

a or so r o s o o so s al s a l y os r a ro lo a a r s os so r a r as r o s o o . s r s also ro r a r s al a o o la o r, a a , a a al r y lar r r s . so as s, ll lo a o o o o so s al ss ll o . or a l , ll a a a's os o l r- r a ss o a a o al s r s ry lo . s, s a ra o al os ro a ly ll o o all as s s or s s r rs.

THE VERSON STAMPING MACHINE

1 rso (a . . r lo a a o) ro a 1 - r - all al- s a a a s s o a o s a s as as 12 lo o o s. s $ 0 ll o a , s a s l s ra s s o s l o a o o- l oo s a rs, a l s a o a rs o a ar s s s o ar o rs or ol r s a r ss s. s l a s s o a ll o a o ar s a y ar. o, o a os sa ro s a , a a o a a r r s a s a o ro o o s all s ar s. y allo s o s os -sa o , lar r s a s o o s o s al .

THE DAILY NEWSPAPER

a ly s a r s o ly o o o o y's r a ar a s. o all r so r s a ar o o ro r or rs, l ry o l , o- o ra rs, ors, a a , r r ss s, l lls, l ll or rs, a a r rs, or s - ro r s, lo rs, lo r r rs, a o a o . , or 0 yo a y a - al y s a r a or s.

a al r aso a s a rs a s lo r s ar lo os s r s l ro o o s o s al . o ly 100 or 200 o l o a r a ay, a ra os o a a r o l ly a s o r a ( ) os s o ro a r o l s r a o r so r a rs.

l s rs s ll o sa s or r s o o sa s o s a rs a ay, y s r a r o r a os ry ly. y also a lly s s ly r r ss s. or o r aso s, a ra o al os o a a r s s o a s. or o r, r a r r o r a rs, or o y a r s rs ar ll o ay or a s a . a a r l s r o s a r lo .

GENERAL MOTORS

s o G ral o ors, orl 's lar s a o ro r, ar ll a ar o r al s o s o o s o s al . r s o a o s ry say G 's lar s ay a l a l y s s s a ally lar r a or a a l r- rysl r a s lar r a oyo a a o a o . o ar s o ors, G as a os sa a a a ay l la s s s a al l lo - r ar s ar . s ll o s o ollars o s o r , G s ll as lo s ro y a s os r ar s ry.

o ry o r s al s o o s, G as a s ral a o s. as s a - l s o r s (o ro s) s all r or r als s as oyo a o r s ro o os s. as r a a r , a s ara , s a -alo a o a a r o a y. as a o s a o o s o s (rol , , o a, l s o l , a a lla) r a r a o o y r s o s yl , r , a ar s o s o r lay rs o a a r al a ro al r r s o a . ally, G as r or a o a s all- ar ro a a s a l ry ro o ry o os s a r ars o ar as r. r s a o s ll o r o G ’s s o o s o s al r a s o s .

Minimum Efficient Scale and Industry Structure

MINIMUM EFFICIENT SCALE (MES) The lowest level of output at which a firm can minimize long-run average costs.

o o s a s o o s o s al ar a or a r a o a s ry’s s r r . r ro o o **minimum efficient scale (MES)**, s lo s l l o o a a r a lo -r a ra os s. r - (a) a l l o rs a $_1$ s o o . a s o ra o o s a r r s os al , r s ro s s a ally r a ro s o l also r al a a a l a ra os s. ally, r s $_1$ o $_2$ ra o l ally , so o l o s r rs o a s ry s os o o s o o la y r s o r s s. a ar l, oo ro ss , r r , oo ro s, s o oar , a s all- a l a s r s ar a l s. a ra o o s a r r s o s al , r la ly lar a r la ly s all r s a o s a s ry a ally s ss l.

o ar s r - ( ), r o o s o s al r a l o r a ra o o a s o o s o s al a ar o ly a ry l ls o o - . s a r o l lo -r a ra o al os ay o r o r a ra o o , as a o o l , al , s l, a o r a y s r s. sa a r ol s s ral o s r s r la o or- a o olo y, or a l , o r ro s, o ra sys so ar , a r s r ro s o .

G o s r a , ro o ll a a lar - s al ro rs. all r s a o r al s al a ll o a l o o . r , o o s o s al yo ar ’s s , r s l a s r **natural monopoly**, a r la ly rar ar- s a o a ra o al os s o ly o r ro s ar lar oo or s r .

NATURAL MONOPOLY An industry in which economies of scale are so great that a single firm can produce the product at a lower average total cost than if more than one firm produced the product.

r o o s o s al ar a s o o s o o lay ly, s o rs a a lo l l o o , as s o r - ( ). s s r s a ar lar l l o o s r a ll s or a lar r o r la ly s all ro rs. a y r a l ra s a so y s o ar all o s a ory. o o r a s o l a a r , s as a , lo - , a s o s r s. a rly s all r s ar as as, or or a , lar -s al ro rs s s r s.

r o r s a s a o lo -r a ra - o al- os r s r- y olo y a o o s a s o o s o s al a r s l . s a o lo -r r , r , a s a r r a s ry s o la y a r la ly lar r o s all r s or s o a y a lar ro rs, or l s so r .

s a o s o r ass ss , a s s ry s r r o s o o os o o s alo . Go r ol s, o ra s o ar- s, a a r al s ra y a s ll, a o r a ors s o s r la - s r r o a ar lar s ry. (*Key Question 12*)

QUICK REVIEW

- Most firms have U-shaped long-run average-total-cost curves, reflecting economies and then diseconomies of scale.
- Economies of scale are the consequence of greater specialization of labour and management, more efficient capital equipment, and the spreading of startup costs among more units of output.
- Diseconomies of scale are caused by the problems of coordination and communication that arise in large firms.
- Minimum efficient scale is the lowest level of output at which a firm's long-run average total cost is at a minimum.

The LAST word

IRRELEVANCY OF SUNK COSTS

Sunk costs should be disregarded in decision making.

There is an old saying: Don't cry over spilt milk. The message is that once you have spilled a glass of milk, there is nothing you can do to recover it, so you should forget about it and move on from there. This saying has great relevance to what economists call *sunk costs*. Such costs are like sunken ships on the ocean floor: once these costs are incurred, they cannot be recovered.

Let's gain an understanding of this idea by applying it first to consumers and then to businesses. Suppose you buy an expensive ticket to an upcoming football game, but the morning of the game you wake up with a bad case of the flu. Feeling miserable, you step outside to find that the wind chill is about –20 degrees. You absolutely do not want to go to the game, buy you remind yourself that you paid a steep price for the ticket. You call several people to try to sell the ticket, but you soon discover that no one is interested in it, even at a discounted price. You conclude that everyone who wants a ticket has one.

Should you go to the game? Economic analysis says that you should not take actions for which marginal cost exceeds marginal benefit. In this situation, the price you paid for the ticket is irrelevant to the decision; both marginal or additional costs and marginal or additional benefit are forward-looking. If the marginal cost of going to the game is greater than the marginal benefit, the best decision is to go back to bed. This decision should be the same whether you paid $2, $20, or $200 for the game ticket, because the price that you pay for something does not affect is marginal benefit. Once the ticket has been purchased and cannot be resold, its cost is irrelevant to the decision to attend the game. Since you absolutely do not want to go, clearly the marginal cost exceeds the marginal benefit of the game.

Here is a second consumer example. Suppose a family is on vacation and stops at a roadside stand to buy some apples. The kids get back into the car and bite into their apples, immediately pronouncing them "totally mushy" and unworthy of another bite. Both parents agree that the apples are "terrible," but the father continues to eat his, because, as he says, "We paid a premium price for them." One of the older children replies, "Dad, that is irrelevant." Although not stated very diplomatically, the child is exactly right. In making a new decision, you should ignore all costs that are not affected by the decision. The prior bad decision (in retrospect) to buy the apples should not dictate a second decision for which marginal benefit is less than marginal cost.

Now let's apply the idea of sunk costs to firms. Some of a firm's costs are not only fixed (recurring, but unrelated to the level of output) but are sunk (unrecoverable). For example, a nonrefundable annual lease payment for the use of a store cannot be recouped once it has been paid. A firm's decision about whether to move from the store to a more profitable location does not depend on the amount of time remaining on the lease. If moving means greater profit, it makes sense to move whether there are 300 days, 30 days, or 3 days left on the lease.

Or, as another example, suppose a firm spends $1 million on R&D to bring out a new product, only to discover that the product sells very poorly. Should the firm continue to produce the product at a loss even when there is no realistic hope for future success? Obviously, it should not. In making this decision, the firm realizes that the amount it has spent in developing the product is irrelevant; it should stop production of the product and cut its losses. In fact, many firms have dropped products after spending millions of dollars on their development. Examples are the quick decision by Coca-Cola to drop its New Coke and the eventual decision by McDonald's to drop its McLean Burger.

Consider a final real-world example. For decades, Boeing and McDonnell Douglas were keen rivals in the worldwide sale of commercial airplanes. Each company spent billions of dollars on R&D and marketing in an attempt to gain competitive advantages over each other. Then, in 1996 they suddenly merged. Many observers wondered how two fierce rivals who had spent such huge amounts to compete could suddenly forget the past and agree to merge. But these past efforts and expenditures were irrelevant to the decision; they were sunk costs. The forward-looking decision led both companies to conclude, each for its own reasons, that the marginal benefit of a merger would outweigh the marginal cost.

In short, if a cost has been incurred and cannot be partly or fully recouped by some other choice, a rational consumer or firm should ignore it. Sunk costs are irrelevant. Or, as the saying goes, don't cry over spilt milk.

CHAPTER SUMMARY

1. The firm is the most efficient form of organizing production and distribution. The main goal of a firm is to maximize profit.
2. Sole proprietorships, partnerships, and corporations are the major legal forms that business enterprises may assume. Though proprietorships dominate numerically, the bulk of total output is produced by corporations. Corporations have grown to their position of dominance in the business sector primarily because they are characterized by limited liability and can acquire money capital for expansion more easily than other firms can.
3. Economic costs include all payments that must be received by resource owners to ensure a continued supply of needed resources to a particular line of production. Economic costs include explicit costs, which flow to resources owned and supplied by others, and implicit costs, which are payments for the use of self-owned and self-employed resources. One implicit cost is a normal profit to the entrepreneur. Economic profit occurs when total revenue exceeds total cost (= explicit costs + implicit costs, including a normal profit).
4. In the short run a firm's plant capacity is fixed. The firm can use its plant more or less intensively by adding or subtracting units of various resources, but it does not have sufficient time in the short run to alter plant size.
5. The law of diminishing returns describes what happens to output as a fixed plant is used more intensively. As successive units of a variable resource such as labour are added to a fixed plant, beyond some point the marginal product associated with each additional worker declines.
6. Because some resources are variable and others are fixed, costs can be classified as variable or fixed in the short run. Fixed costs are independent of the level of output;

variable costs vary with output. The total cost of any output is the sum of fixed and variable costs at that output.

7. Average fixed costs, average variable costs, and average total costs are fixed, variable, and total costs per unit of output. Average fixed cost declines continuously as output increases because a fixed sum is being spread over an increasing number of units of production. A graph of average variable cost is U-shaped, reflecting the law of diminishing returns. Average total cost is the sum of average fixed and average variable costs; its graph is also U-shaped.
8. Marginal cost is the extra, or additional, cost of producing one more unit of output. It is the amount by which total cost and total variable cost change when one more or one fewer unit of output is produced. Graphically, the marginal-cost curve intersects the ATC and AVC curves at their minimum points.
9. Lower resource prices shift cost curves downward, as does technological progress. Higher input prices shift cost curves upward.
10. The long run is a period of time sufficiently long for a firm to vary the amounts of all resources used, including plant size. In the long run all costs are variable. The long-run ATC, or planning, curve is composed of segments of the short-run ATC curves, and it represents the various plant sizes a firm can construct in the long run.
11. The long-run ATC curve is generally U-shaped. Economies of scale are first encountered as a small firm expands. Greater specialization in the use of labour and management, the ability to use the most efficient equipment, and the spreading of startup costs among more units of output all contribute to economies of scale. As the firm continues to grow, it will encounter diseconomies of scale stemming from the managerial complexities that accompany large-scale production. The output ranges over which economies and diseconomies of scale occur in an industry are often an important determinant of the structure of that industry.

TERMS AND CONCEPTS

plant, p. 181
firm, p. 181
industry, p. 181
sole proprietorship, p. 181
partnership, p. 181
corporation, p. 181
stocks, p. 183
bonds, p. 183
limited liability, p. 183
double taxation, p. 183
principle–agent problem, p. 183
economic (opportunity) cost, p. 184
explicit costs, p. 185
implicit costs, p. 185
normal profit, p. 185
economic profit, p. 186
short run, p. 187
long run, p. 187
total product (TP), p. 188
marginal product (MP), p. 188
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law of diminishing returns, p. 188
fixed costs, p. 192
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average variable cost (AVC), p. 194
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marginal cost (MC), p. 195
economies of scale, p. 202
diseconomies of scale, p. 203
constant returns to scale, p. 203
minimum efficient scale (MES), p. 207
natural monopoly, p. 207

STUDY QUESTIONS

1. Distinguish between a plant, a firm, and an industry. Why is an industry often difficult to define?
2. **KEY QUESTION** What are the major legal forms of business organization? Briefly state the advantages and disadvantages of each. How do you account for the dominant role of corporations in the Canadian economy?
3. "The legal form an enterprise takes is dictated primarily by the financial requirements of its particular line of production." Do you agree? Why or why not?
4. **KEY QUESTION** Gomez runs a small pottery firm. He hires one helper at $12,000 per year, pays annual rent of $5000 for his shop, and spends $20,000 per year on

materials. He has $40,000 of his own funds invested in equipment (pottery wheels, kilns, and so forth) that could earn him $4000 per year if alternatively invested. He has been offered $15,000 per year to work as a potter for a competitor. He estimates his entrepreneurial talents are worth $3000 per year. Total annual revenue from pottery sales is $72,000. Calculate the accounting profit and the economic profit for Gomez's pottery firm.

5. Which of the following are short-run and which are long-run adjustments? (a) Wendy's builds a new restaurant. (b) Acme Steel Corporation hires 200 more workers. (c) A farmer increases the amount of fertilizer used on his corn crop. (d) An Alcan aluminum plant adds a third shift of workers.

6. **KEY QUESTION** Complete the following table by calculating marginal product and average product from the data given.

Inputs of lalbour	Total product	Marginal product	Average product
0	0		
1	15	______	______
2	34	______	______
3	51	______	______
4	65	______	______
5	74	______	______
6	80	______	______
7	83	______	______
8	82	______	______

Plot the total, marginal, and average products and explain in detail the relationship between each pair of curves. Explain why marginal product first rises, then declines, and ultimately becomes negative. What bearing does the law of diminishing returns have on short-run costs? Be specific. "When marginal product is rising, marginal cost is falling. When marginal product is diminishing, marginal cost is rising." Illustrate and explain graphically.

7. Why can the distinction between fixed costs and variable costs be made in the short run? Classify the following as fixed or variable costs: advertising expenditures, fuel, interest on company-issued bonds, shipping charges, payments for raw materials, real estate taxes, executive salaries, insurance premiums, wage payments, depreciation and obsolescence charges, sales taxes, and rental payments on leased office machinery. "There are no fixed costs in the long run; all costs are variable." Explain.

8. List several fixed and variable costs associated with owning and operating an automobile. Suppose you are considering whether to drive you car or fly 1000 kilometres for spring break. Which costs—fixed, variable, or both—would you take into account in making your decision? Would any implicit costs be relevant? Explain.

9. **KEY QUESTION** A firm has $60 in fixed costs and variable costs as indicated in the table below. Complete the table; check your calculations by referring to question 4 at the end of Chapter 9.

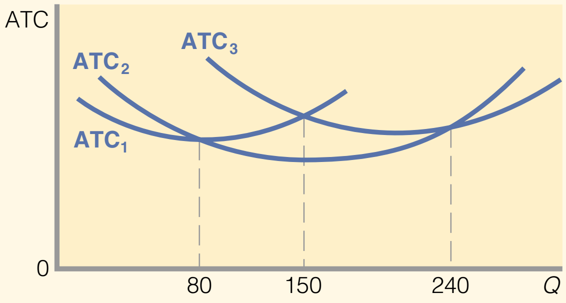
Total product	Total fixed cost	Total variable cost	Total cost	Average fixed cost	Average variable cost	Average total cost	Marginal cost
0	$______	$ 0	$______	$______	$______	$______	$______
1	______	45	______	______	______	______	______
2	______	85	______	______	______	______	______
3	______	120	______	______	______	______	______
4	______	150	______	______	______	______	______
5	______	185	______	______	______	______	______
6	______	225	______	______	______	______	______
7	______	270	______	______	______	______	______
8	______	325	______	______	______	______	______
9	______	390	______	______	______	______	______
10	______	465	______	______	______	______	______

- **a.** Graph total fixed cost, total variable cost, and total cost. Explain how the law of diminishing returns influences the shapes of the variable-cost and total-cost curves.
- **b.** Graph AFC, AVC, ATC, and MC. Explain the derivation and shape of each of these four curves and their relationships to one another. Specifically, explain in nontechnical terms why the MC curve intersects both the AVC and ATC curves at their minimum points.
- **c.** Explain how the location of each curve graphed in question 7b would be altered if (1) total fixed cost had been $100 rather than $60, and (2) total variable cost had been $10 less at each level of output.

10. Indicate how each of the following would shift the (1) marginal-cost curve, (2) average-variable-cost curve, (3) average-fixed-cost curve, and (4) average-total-cost curve of a manufacturing firm. In each case specify the direction of the shift.

- **a.** A reduction in business property taxes
- **b.** An increase in the nominal wages of production workers
- **c.** A decrease in the price of electricity
- **d.** An increase in insurance rates on plant and equipment
- **e.** An increase in transportation costs

11. Suppose a firm has only three possible plant-size options, represented by the ATC curves shown in the accompanying figure. What plant size will the firm choose in producing (a) 50, (b) 130, (c) 160 and (d) 250 units of output? Draw the firm's long-run average-cost curve on the diagram and describe this curve.



12. **KEY QUESTION** Use the concepts of economies and diseconomies of scale to explain the shape of a firm's long-run ATC curve. What is the concept of minimum efficient scale? What bearing can the shape of the long-run ATC curve have on the structure of an industry?

13. **(The Last Word)** What is a sunk cost? Provide an example of a sunk cost other than one from the text. Why are such costs irrelevant in making decisions about future actions?

INTERNET APPLICATION QUESTIONS

1. Check out the *National Post* 500 list of the largest Canadian firms at <www.nationalpostbusiness.com/datamining/top500/top500.htm>. From the top ten profit list, select three firms from three different industries and discuss the likely sources of economies of scale that underlie their large size.

2. Use the Yahoo search engine at <www.yahoo.ca> to locate a company's homepage of your choice. Find and review the company's income statement in its annual report and classify the nonrevenue items as either fixed or variable costs. Are all costs clearly identifiable as either fixed or variable? What item would be considered as accounting profit? Would economic profit be higher or lower than this accounting profit?

CHAPTER NINE

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IN THIS CHAPTER YOU WILL LEARN:

The four basic market structures and how they determine the degree of competition among firms.

•

The four conditions required for perfectly competitive markets.

•

The profit-maximizing output in the short-run for a firm in pure competition.

•

About the marginal cost and the short-run supply curve.

•

About the firm's profit maximization in the long run.

•

That in competitive markets firms attain both allocative and productive efficiency.

In Chapter 7 we examined the relationship between product demand and total revenue, and in Chapter 8 we discussed costs of production. Now we want to put revenues and costs together to see how a business decides what price to charge and how much output to produce. A firm's decisions concerning price and production depend greatly on the character of the industry in which it is operating; there is no average or typical industry. At one extreme is a single producer that dominates the market; at the other extreme are industries in which thousands of firms each produce a minute fraction of market supply. Between these extremes are many other industries.

a o a a s ry ally, ll o so s ral as o ls o ar s r r o l yo rs a o r a o ar r- a y ro ar s o o y. o ls ll also l yo o ass ss y or y o os ar s.

FOUR MARKET MODELS

PURE COMPETITION A market structure in which a very large number of firms produce a standardized product.

PURE MONOPOLY A market structure in which one firm is the sole seller of a product or service.

MONOPOLISTIC COMPETITION A market structure in which a relatively large number of sellers produce differentiated products.

OLIGOPOLY A market structure in which a few large firms produce homogeneous or differentiated products.

IMPERFECT COMPETITION The market models of pure monopoly, monopolistic competition, and oligopoly considered as a group.

o o ss ro s r s o o r s ar s r r s r o - o , r o o oly, o o ol s o o , a ol o oly. s o r ar o ls r s ral r s s r o r s s ry, r os r s ro a s a ar ro or ry o r a r ro s ro os o o r r s, a o asy or o l s or r s o r s ry.

ry r y o r o ls ar as ollo s

- **Pure competition** s a ar s r r a r r s a ry lar r o r s ro a s a ar ro (a s, a ro al o a o o r ro rs, s as or or rs). r s a r s- ry ry as ly.
- **Pure monopoly** s a ar s r r o r s sol s ll r o a ro or s r (or a l , a lo al a l o a y). ry o a o al r s s lo , o r o s s r s ry. a s o o ol s ro s a ro , a s o or o r a s ro .
- **Monopolistic competition** s ara r y a r la ly lar r o s ll rs ro r a ro s (lo , r r , oo s). r s s r a *non ice com e i ion*, a s ll s ra y o r r s o s s s ro or s r ro all o ro s as o a r - s l s a al y (a a roa all *od c diffe en ia ion*). ry o o o ol s ally o s r s s asy.
- **Oligopoly** ol s o ly a s ll rs o a al or s lar ro o - s ly a r s a y s o s o s r als a s a os s o s o a o r s o r a o .

a l -1 s ar s ara r s s o o r o ls or asy o ar so . s ss s o r ar o ls, ll o as o ally s s ara - r s s o a *e com e i ion* ro os o r o r as ar s r r s, o r ll s a as **imperfect competition**.

PURE COMPETITION: CHARACTERISTICS AND OCCURRENCE

’s a a ll r loo a r o o , o so r a ro s a r.

- *Very large numbers* as a r o a r ly o ar s r s- o a lar r o s ll rs a ly, o o r r ro s lar a o al or r a o al ar s. a l s l ar s or ar o o s, s o ar , a or a ar .

TABLE 9-1 CHARACTERISTICS OF THE FOUR BASIC MARKET MODELS

	MARKET MODEL			
Characteristic	**Pure competition**	**Monopolistic competition**	**Oligopoly**	**Pure monopoly**
Number of firms	A very large number	Many	Few	One
Type of product	Standardized	Differentiated	Standardized or differentiated	Unique; no close substitutes
Control over price	None	Some, but within rather narrow limits	Limited by mutual interdependence; considerable with collusion	Considerable
Conditions of entry	Very easy, no obstacles	Relatively easy	Significant obstacles	Blocked
Nonprice competition	None	Considerable emphasis on advertising, brand names, trademarks	Typically a great deal, particularly with product differentiation	Mostly public relations advertising
Examples	Agriculture	Retail trade, dresses, shoes	Steel, automobiles, farm implements, many household appliances	Local utilities

- ***Standardized product*** r ly o r s ro a s a ar (or o o o s) ro . s lo as r s sa , o s rs ll r a o s ll r o y ro ro . y rs ro - s o r s , , , a as r s s s or ro o r . a s r ly o r s s ll s a ar ro s, y a o a o r a r ro s a o o a o r or s o o r o o .

- ***Price-takers*** r ly o ar s al r s r o s - a o rol o r ro r . a r ro s s a s all ra o o o al o a r as or r as s o ll o r ly o al s ly or, r or , ro r . s or , o r s a **price-taker** a o a ar r , a o ly a s o . a a s a al o ro r s a r y o ar . s a r r a ar r o l l o s rs ll o y ro r a $2.0 s o ors ar s ll a al ro a $2 r . o rs ly, a s r a s ll as as oos s a $2 r , as o r aso o ar a lo r r , say, $1. , or o o so o l lo r s ro .

PRICE-TAKER
A firm in a purely competitive market that cannot change market price, only adjust to it.

- ***Free entry and exit*** r s a r ly r, a s r s a r ly l a , r ly o s r s. o s a l al, olo al, a - al, or o r o s a l s ro r s ro s ll r o a y o - ar .

Relevance of Pure Competition

<n103dept.matc.edu/walshj/chrono/Chrono%202/purecomp3.htm> A quick summary of pure competition

l o r o o s r la ly rar r al orl , s ar o l s ly r l a . s r s or los ly a ro a r o o a a y o r ar s r r . ar lar, a l ar a o ar s or a r- l ral oo s, s ro s, or a , as als, a s o s ar s y s y r o o o l. lso, r o o s a a l s ar- o or a y s ss o o r a o r a o . o ra o o a r ly o o o y ro s a s a ar , or or , or al a - y o r al- orl o o y.

DEMAND FOR A PURELY COMPETITIVE SELLER

AVERAGE REVENUE Total revenue from the sale of a product divided by the quantity of the product sold.

o lo a a lar a ra al o l o r o o , rs a a ro a o s ll r's o a s o a s r . s s ll r a a ar r, a s ra rry ro r, or a s ra r. a r ly o r o rs o ly a l l ra o o o al ar s ly, r or , s a r r y ar s a r - a r, o a r - a r.

Perfectly Elastic Demand

a r o o r , as r r s y ol s 1 a 2 a l -2, s r ly las . ss o a l , ar r s $1 1. r r r s a o o a a r r y r s r s o , or o s o lo r s r o r as s sal s ol . ar *no* say a *ma ke* a s r- ly las a o ar . ar a ra s ar s al o slo r , as a la a a a r - ( ) ll r al. a , o al- a r s or os a r l ral ro s ar las , o a r l r s os o s ry a a a o o y. r s ry (all r s ro a ar lar ro) a a r y a s ry o . or a l , all r s, a - ly s l a o sly, a r as r y r o , al r a o o a . o a s l a y *indi id al m* a r ly o - s ry s r ly las a ar r , as s o r -1.

TABLE 9-2 THE DEMAND AND REVENUE SCHEDULES FOR A PURELY COMPETITIVE FIRM

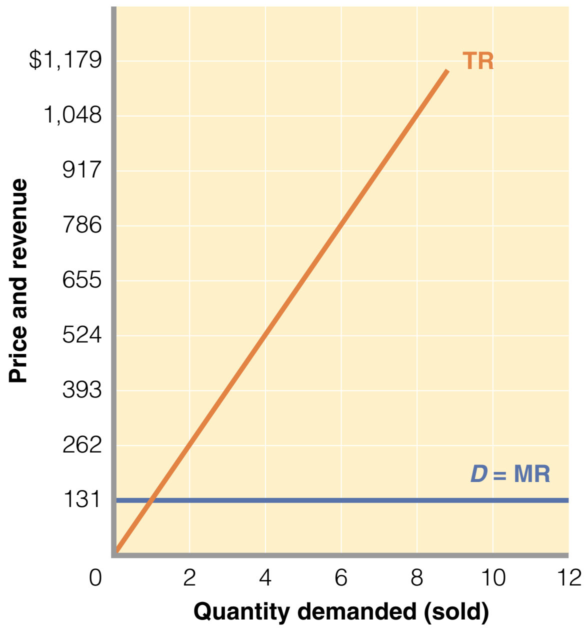
FIRM'S DEMAND SCHEDULE		FIRM'S REVENUE DATA	
(1) Product price, *P* (average revenue)	(2) Quantity demanded, *Q*	(3) Total revenue, TR (1) × (2)	(4) Marginal revenue, MR
$131	0	$ 0	
			$131
131	1	131	
			131
131	2	262	
			131
131	3	393	
			131
131	4	524	
			131
131	5	655	
			131
131	6	786	
			131
131	7	917	
			131
131	8	1,048	
			131
131	9	1,179	
			131
131	10	1,310	

Average, Total, and Marginal Revenue

r 's a s l s also s r s l . r r o r as r s also r r , or a ra r , o s ll r. o say a all y rs s ay $1 1 r s o say a r r , or **average revenue**, r y s ll r s $1 1.

FIGURE 9-1 DEMAND, MARGINAL REVENUE, AND TOTAL REVENUE OF A PURELY COMPETITIVE FIRM

A purely competitive firm can sell additional units of output at the market price, and thus its marginal-revenue curve (MR) coincides with its perfectly elastic demand curve (*D*). The firm's total-revenue curve (TR) is a straight upward-sloping line.



TOTAL REVENUE The total number of dollars received by a firm from the sale of a product.

MARGINAL REVENUE The change in total revenue that results from selling one more unit of a firm's product.

total revenue or a sal s l l s o y l ly r y orr - s o a y r a s ll. (ol 1 l l y ol 2 a l -2 y l s ol .) s as , o al r r as s y a o s a a o , $1 1, or a a o al o sal s. a sol a s a ly s o s a r o o al r .

a r s o r a a s o , ll o s r o s o al r - ll a as a r s l . a ll a o al r ro s ll a o r o o **Marginal revenue** s a o al r , a s, ra r , a r s l s ro s ll o or o o . ol , a l -2, o al r s ro ro s ar sol . rs o o sol r as s o al r ro ro o $1 1 ar al r or a s $1 1. s o sol r as s o al r ro $1 1 o $2 2, a ar al r s a a $1 1. o ol a , as s r , ar al r s a o s a $1 1. r o o , ar al r a r ar al. (*Key Question* 3)

Graphical Portrayal

r -1 s o s r ly o r 's a r a o al-r a ar al-r r s. a r (*D*) s or o al, a r r las y. ar al-r r ( ) o s a r , a s ro r (a) s o s a . o al r ( ) s a s ra l a slo s ar o r . s slo s o s a a s a ra o sal s r as s y $1 1.

QUICK REVIEW

- In a purely competitive industry a large number of firms produce a standardized product and no significant barriers to entry exist.
- The demand of a competitive firm is perfectly elastic—horizontal on a graph—at the market price.
- Marginal revenue and average revenue for a competitive firm coincide with the firm's demand curve; total revenue rises by the product price for each additional unit sold.

PROFIT-MAXIMIZATION IN THE SHORT RUN

r ly o r sa r -a r, a a s o o ro (or s loss) o ly y a s s *o* . s or r , r as a la . s, a a s s o o ly ro a s a o o ar a l r so r s (a r als, la o r) s s. a s s s ar a l r so r s o a o l l a a s s ro .

r ar o ays o r l l o o a a o r ll r al a ro or a o o loss. o s o o - ar o al r a o al os o r s o o ar ar al r a ar- al os . o a roa s a ly o all r s, r y ar r o ors, r o o ol s s, o o ol s o ors, or ol o ol s s.[1]

Total-Revenue–Total-Cost Approach: Profit-Maximization Case

ar r o s ro y ar , o ro r ll as (1) o l ro s ro (2) so, a a o ( ) a o o ro (or loss) ll r al ʼs o s ra o a r r o o a s rs s s o s, r a os a a a a s ar r . r os a a ar alr a y a l ar o yo a s y ar - os , ar a l - os , a o al- os a a a l -2, r a ol s 1 o a l - . (all a s a a r l a l os s, l a or al ro .) ss a ar r s $1 1, o al r or a o l l s o y l ly o (o al ro -) y r . o al r a a ar ol . ol ro or loss a a o l l y s ra o al os , (ol), ro o al r - , (ol).

o l r ro ly. a r al a ro y o so. o s o l ro s. ol lls s a s s o a o al o o ro s a a a . a o o ro (or loss) ll r r al $2 o o ro r o al r ($1,1) a o al os ($ 0).

r -2(a) o ar s o al r a o al os ra ally or s ro - a as . s r a a a o al r r or a r ly o

---

[1] To make sure you understand these two approaches, we will apply them both to output determination under pure competition, but since we want to emphasize the marginal approach, we will limit our graphical application of the total-revenue approach to a situation where the firm maximizes profits. We will then use the marginal approach to examine three cases: profit maximization, loss minimization, and shutdown.

TABLE 9-3 THE PROFIT-MAXIMIZING OUTPUT FOR A PURELY COMPETITIVE FIRM: TOTAL-REVENUE–TOTAL-COST APPROACH (PRICE $131)

				PRICE: $131	
(1) Total product (output), *Q*	(2) Total fixed cost, TFC	(3) Total variable cost, TVC	(4) Total cost, TC	(5) Total revenue, TR	(6) Profit (+) or loss (–)
0	$100	$ 0	$ 100	$ 0	$–100
1	100	90	190	131	– 59
2	100	170	270	262	– 8
3	100	240	340	393	+ 53
4	100	300	400	524	+124
5	100	370	470	655	+185
6	100	450	550	786	+236
7	100	540	640	917	+277
8	100	650	750	1,048	+298
9	100	780	***880***	***1,179***	***+299***
10	100	930	1,030	1,310	+280

r s a s ra l (r -2). o al os r as s o a or ro- o r r s or r so r s, ra o r as o al os ar s r la y o r . ally, os a a r a r 's la o s ar al r r s. ro ro o o r s o o , o al os r as s a a r as ra as r s s s r so r s or ly. a - o al o , o al os s o r s y r- r as a o s a s o s r r s a o a y or s s o la .

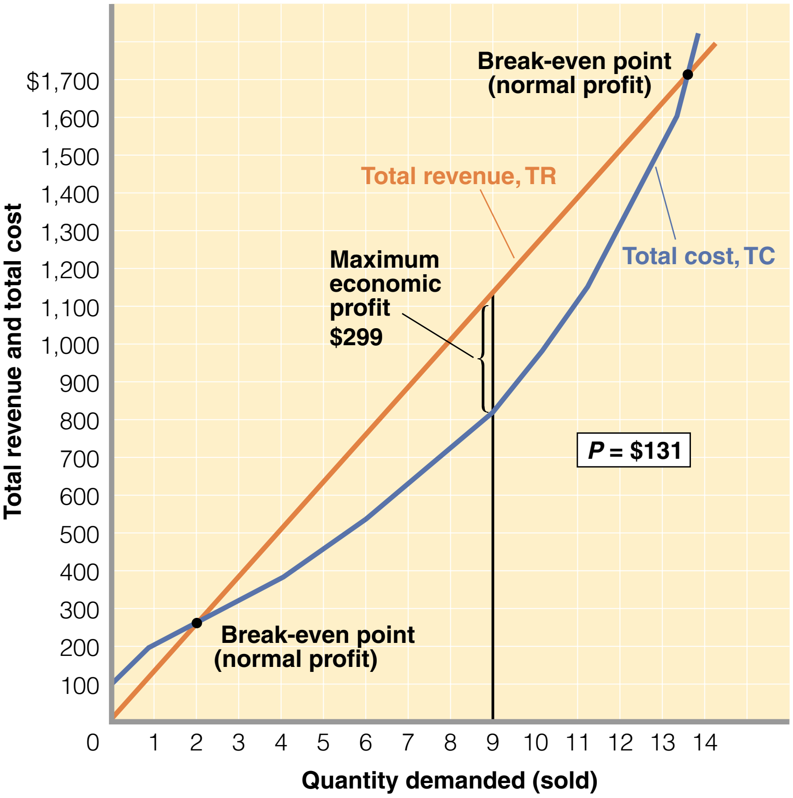
o al r a o al os ar al r o r s r -2(a) r- s (a ro ly o s o o). o al r o rs all os s (l a or- al ro , s l os r) r s o o o ro . or s r aso o o s s all s o a **break-even point** a o a a r a s a *no mal o* o a o o ro . a a yo 10 s o o , a o r r a - o o l o r r o al os o l a o al r so r 1 a 1 s o o r -2(a). y o o r a - o s - r ll ro a o o ro . r a s a ro , o - r, r r al s a o al-r a o al- os r s s r a s . or o r ar lar a a, s s a s o o , r a ro s $2 .

BREAK-EVEN POINT An output at which a firm makes a normal profit but not an economic profit.

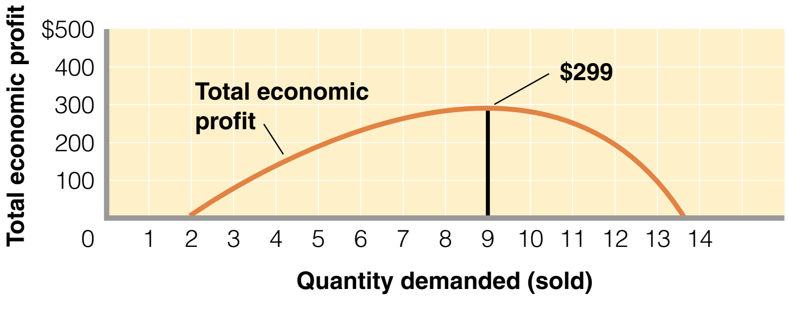
ro - a o s as r o s r -2( ), r o al o- o ro s ra or a l lo o . r o al-r a o al- os r s rs r -2(a), o o ro s ro, as s o y o al- ro l r -2( ). r r al s a a s r a s r ra , o o ro s a s a ($2), as s o lo r ra . s r ll oos o ro s, s a o a - s s ro .

FIGURE 9-2 TOTAL-REVENUE–TOTAL-COST APPROACH TO PROFIT MAXIMIZATION FOR A PURELY COMPETITIVE FIRM

Panel (a): The firm's profit is maximized at that output (nine units) where total revenue, TR, exceeds total cost, TC, by the maximum amount. Panel (b): The vertical distance between TR and TC in panel (a) is plotted as a total-economic-profit curve. Maximum economic profit is $299 at nine units of output.



(a) Profit-maximizing case



(b) Total economic profit

Marginal-Revenue–Marginal-Cost Approach

Choosing a Little More or Less

s o a roa , r o ar s a o s a a *addi ional* o o o l a o o al r a o o al os . o r or s, r o - ar s *ma ginal e en e* ( ) a *ma ginal co* ( ) o a s ss o o . r ll ro a y o o os ar al r s s ar al os a s r o l a or r ro s ll a a o l a o s os s y ro . o rs ly, ar al os o a o o s s ar al r , r ll o ro a . ro o l a or o os s a o r a ro o l l or loss o l r as .

MR = MC RULE

al s a s o ro o , r o s r la ly lo , ar al r ll s ally (o al ays) ar al os . o s ro a l o ro ro s ra o o . a la r s a s o ro o , r o s r l-a ly , r s ar al os s ll ar al r . o sly, a ro - a r ll a o a o o l ls a ra . ara s o ro o ra s s a o a ar al r als ar al os . s o s y o o - r r l *In he ho n, he m ill ma imi e o o minimi e lo b od cing he o a hich ma ginal e en e e al ma ginal co .* s ro - a s o as **MR = MC rule**. (or os s s o a a a, a ll r s ly al a a ra o al l l o o . s s a s r s o l ro las o l o o or s .)

MR = MC RULE A method of determining the total output at which economic profit is at a maximum (or losses at a minimum).

THREE CHARACTERISTICS OF THE MR = MC RULE

s r a r s o r l

1. r l a l s o ly ro s r ra l o s o . lls o s or ly a ar al r o s o al or a ra ar a l os , r ll r r o s o ra r a ro o .

2. r l s a a ra o ro a a o or all r s r y ar r ly o , o o ol s , o o ol s ally o , or ol o ol s .

. r l a r s a as *P* a l o a r ly o r . a s a s l a y a o s ll r s r ly las a o ar r , ro r a ar al r ar al. o r r o o (a o ly r r o o) ay s s *P* or r l *hen od cing i efe able o h ing do n, he com e i i e m ho ld od ce a ha oin he e ice e al ma ginal co (P).*

o l ’s a ly r l or, a s ar o s r r o o , *P* r l , rs s sa r as o r o al-r o al- os a roa o ro a a o . , y o s r o r r s, ll o s ra o a o al as s loss a o a s o . *I i c cial ha o nde and he MR = MC anal i ha follo ince i ea ea in Cha e 10 and 11.*

PROFIT-MAXIMIZING CASE

rs ol s a l - r ro , , , a a a r or o r ro a l -2. s ar al- os a a o ol a ll o ar r (als ar al r) or a o o . os rs a ar r , a r or ar al r , s $1 1, as s o ol .

a s ro - a o ry o o o a l r r s s r a r ar al r a ar al os o o . a o rs s, r or , a s o r ’s ro a ll ro .

TABLE 9-4 THE PROFIT-MAXIMIZING OUTPUT FOR A PURELY COMPETITIVE FIRM: MARGINAL-REVENUE–MARGINAL-COST APPROACH (PRICE = $131)

(1) Total product (output)	(2) Average fixed cost, AFC	(3) Average variable cost, AVC	(4) Average total cost, ATC	(5) Marginal cost, MC	(6) Price = marginal revenue, MR	(7) Total economic profit (+) or loss (–)
0						$–100
1	$100.00	$90.00	$190.00	$ 90	$131	– 59
2	50.00	85.00	135.00	80	131	– 8
3	33.33	80.00	113.33	70	131	+ 53
4	25.00	75.00	100.00	60	131	+124
5	20.00	74.00	94.00	70	131	+185
6	16.67	75.00	91.67	80	131	+236
7	14.29	77.14	91.43	90	131	+277
8	12.50	81.25	93.75	110	131	+298
9	***11.11***	***86.67***	***97.78***	***130***	***131***	***+299***
10	10.00	93.00	103.00	150	131	+280

, o r, ll o ro . o l a or o os ($1 0) a o r ($1 1).

PROFIT CALCULATIONS

o o ro r al y ro s a al la ro a ra - o al- os a a. l ly r ($1 1) y o ( ), a o al r s $11 . l ly a ra o al os ($.) y o ( ) s s o al os o $ 0.[2] r o $2 ($11 $ 0) s o o ro . s r ll r r o o ra ra r a s o .

r a s a as r ay o al la o o ro s o r ro r y s ra a ra o al os ($.) ro ro r ($1 1) a l ly r (a r- ro o $ .22) y o ( ). a so o o r y rs ol a l - . o ll a a y o o r a os a r o r l ll a r ro s lo $2 or loss s.

GRAPHICAL PORTRAYAL

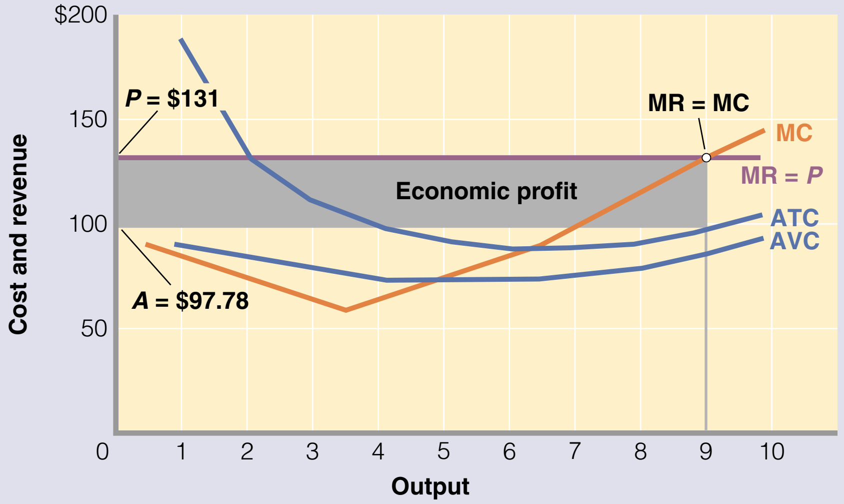
igure - (ey Graph) s o s r ( ) a ar al os ra ally. r als ar al os a ro - a o o s. r r- o o ro s *P A*, r *P* s ar r a *A* s a ra o al os or a o o s. o al o o ro s × (*P A*), s o y r y r a lar ar a.

---

[2] Most of the unit-cost data are rounded figures. Therefore, economic profits calculated from them will typically vary by a few cents from the profits determined in the total-revenue–total-cost approach. Here we simply ignore the few-cents differentials to make our answers consistent with the results of the total-revenue–total-cost approach.

Key Graph

FIGURE 9-3 THE SHORT-RUN PROFIT-MAXIMIZING POSITION OF A PURELY COMPETITIVE FIRM



The MR = MC output enables the purely competitive firm to maximize profits or to minimize losses. In this case MR (= *P* in pure competition) and MC are equal at an output *Q* of nine units. There *P* exceeds the average total cost *A* = $97.78, so the firm realizes an economic profit of *P* – *A* per unit. The total economic profit is represented by the grey rectangle and is 9 × (*P* – *A*).

QUICK QUIZ

1. Curve MR is horizontal because
   a. product price falls as output increases.
   b. the law of diminishing marginal utility is at work.
   c. the market demand for this product is perfectly elastic.
   d. the firm is a price-taker.

2. At a price of $131 and 7 units of output
   a. MR exceeds MC, and the firm should expand its output.
   b. total revenue is less than total cost.
   c. AVC exceeds ATC.
   d. the firm would earn only a normal profit.

3. In maximizing profits at nine units of output, this firm is adhering to which of the following decision rules?
   a. Produce where MR exceeds MC by the greatest amount.
   b. Produce where *P* exceeds ATC by the greatest amount.
   c. Produce where total revenue exceeds total cost by the greatest amount.
   d. Produce where average fixed costs are zero.

4. Suppose price declined from $131 to $100. This firm's
   a. marginal-cost curve would shift downward.
   b. economic profit would fall to zero.
   c. profit-maximizing output would decline.
   d. total cost would fall by more than its total revenue.

Answers

1. d; 2. a; 3. c; 4. c

o a r a s o a s o al ro , o s r- ro . r-
ro s r a s a s s o o , r r s a ra o al os
y $. ($1 1 $ 1.). y ro o ly s s, r o l
or o ro o o o a o al s o o a o l l arly o -
r o o al ro . r s a y o a lo r r- ro s or a -
o al s o o a s y o l ss a o o al ro .

LOSS-MINIMIZING CASE

o l 's ass a ar r s $ 1 ra r a $1 1. o l r s ll
ro so, o a ll r s l ro or loss a s rs,
r s ly, ar s, s, a loss o $.
rs ol s a l - ar sa as os a l - . ol
s o s r (al o), $ 1. o ar ol s a , a
rs o o a s $ 0 o o al os o ly $ 1 o o al r . o -
l o ' ro los o ! a o l as y. r a
ry arly s a s o ro o , o s lo , a ar al os s ally .
r ar al- os r la o s ro s r as ro o . or s
o ro s , r s ar al os . a o s s a s or o
r a o os , a as s o ol , y r as o al loss. o r
y or a o sa or loss a o rs . yo s s, o -
r, s (*P*). r s o l r or ro s s. ral,
ro -s ro r s o l al ays o ar ar al r (or r r
r o o) r s or o o ar al- os s l or r .

LOSS DETERMINATION

ll ro o ro a l o, a s a s s o o a ra o al
os o $ 1. s r o $ 1 y $10. r . l ly a y

TABLE 9-5 THE LOSS-MINIMIZING OUTPUTS FOR A PURELY COMPETITIVE FIRM: MARGINAL-REVENUE–MARGINAL-COST APPROACH (PRICES = $81 AND $71)

(1) Total product (output)	(2) Average fixed cost, AFC	(3) Average variable cost, AVC	(4) Average total cost, ATC	(5) Marginal cost, MC	(6) *$81* price = marginal revenue, MR	(7) Profit (+) or loss (–), *$81* price	(8) *$71* price = marginal revenue, MR	(9) Profit (+) or loss (–), *$71* price
0						$–100		*$–100*
1	$100.00	$90.00	$190.00	$ 90	$81	–109	$71	–119
2	50.00	85.00	135.00	80	81	–108	71	–128
3	33.33	80.00	113.33	70	81	– 97	71	–127
4	25.00	75.00	100.00	60	81	– 76	71	–116
5	20.00	74.00	94.00	70	81	– 65	71	–115
6	*16.67*	*75.00*	*91.67*	*80*	*81*	*– 64*	71	–124
7	14.29	77.14	91.43	90	81	– 73	71	–143
8	12.50	81.25	93.75	110	81	–102	71	–182
9	11.11	86.67	97.78	130	81	–151	71	–241
10	10.00	93.00	103.00	150	81	–220	71	–320

s so o , r 's o al loss s $. l r a ly, o ar o al r o $ (× $ 1) o al os o $ 0 (× $ 1.), s a a a r 's loss s $.

y ro a s s loss s l ss a r 's $100 o os s, s $100 loss r o l r s or r y los o . r r s o r r ($ 1) o o r s a ra ar a l os s o $ a also ro $ r , or a o al o $, o a ly a a s os s. r - or , r 's loss s o ly $ ($100 $), o $100.

GRAPHICAL PORTRAYAL

s loss- as s s o ra ally r - . r r r *P* s a ra ar a l os , , r a ay ar , o all, o s os s y ro . loss s y ro o a (r , s s). a o , a o r s *P* *V* o o r os , r *V* s a s s o o . r- loss s *A* *P* $10. , a o al loss s × (*A* *P*), or $, as s o y r y ar a.

SHUTDOWN CASE

os o a ar y l s a r o o ly $ 1. o l r ro o, a s a ry o r 's a ra ar a l os s r a r a r (o ar ol s a a l -). s all s loss r a r y ro- s r a r a $100 os ll los y s o (as s o y ol). s a o s o s o .

o a s s s o s a o r - . r o s los s o o r- a ra ar a l os s a (*P*) o o s. r , r or r r o l all s or o a ra ar a l os y $ ($ $ 1). y ro a (*P*) o , r o l los s $100 or o os l s $1 ($ o ar a l os o a o s), or a o al loss o

FIGURE 9-4

If price *P* exceeds the minimum AVC (here $74 at *Q* = 5) but is less than ATC, the MR = MC output (here six units) will permit the firm to minimize its losses. In this instance the loss is *A* – *P* per unit, where *A* is the average total cost at six units of output. The total loss is shown by the grey area and is equal to 6 × (*A* – *P*).

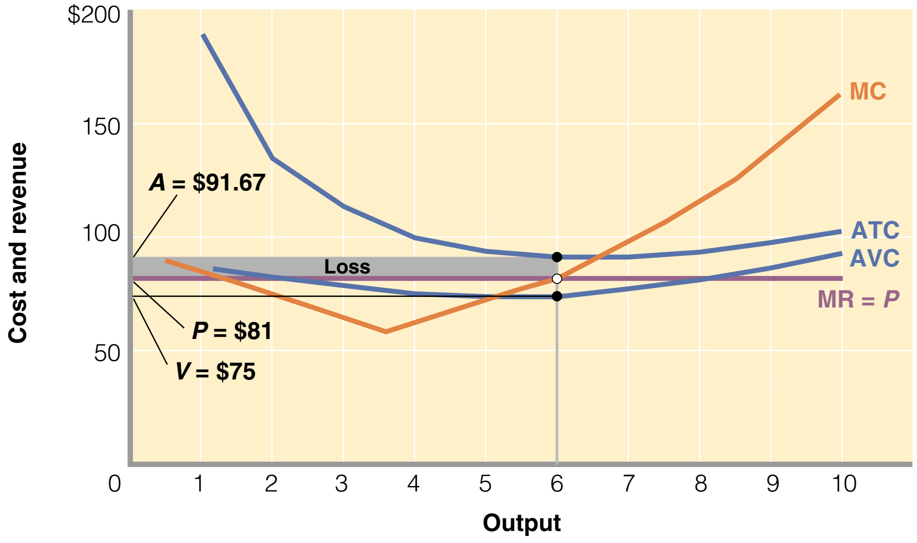
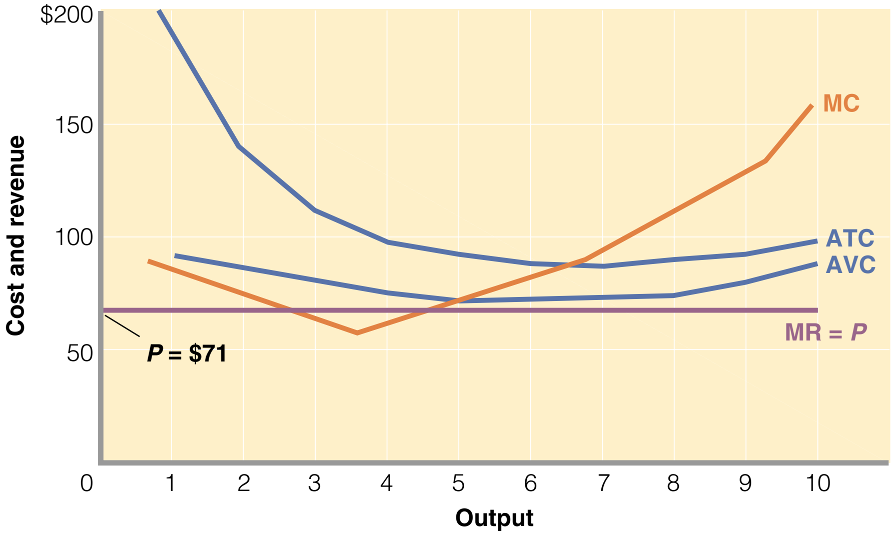


FIGURE 9-5 THE SHORT-RUN SHUTDOWN POSITION OF A PURELY COMPETITIVE FIRM

If price *P* falls below the minimum AVC (here $74 at *Q* = 5), the competitive firm will minimize its losses in the short run by shutting down. There is no level of output at which the firm can produce and realize a loss smaller than its total fixed cost.



$11 . s r o ar s a o ra ly $100 - os loss r o l r y s o a ro o o . o, ll a s s or r o s o ra r a ro a a $ 1 r or a a y r l ss a a ra ar a l os o $.

s o as r s s o al r o o r (*P*) r l . o - r ll a ro or loss s or r y ro a o a (*P*) , *o ided ha ma ke ice e ceed minim m a e - age a iable co* .

MARGINAL COST AND SHORT-RUN SUPPLY

r s o s ly s l r r r s a as a a y ro -s o r , a r a os s, o l oos o o r ar a a r . s s o ro r s a orr s o a ss l o s s ar o s ly s l or o r . a l - s ar s s ly s l a a or os r r s ($1 1, $ 1, a $ 1) a o r o rs. s a l o r s r r la o s ro - r a a y s l a a r . o rs a r ll o ro a r $ 1 or $ 1, a s o ar l ss a $ - . o a a y s l r as s as r r as s. s r ally a o o ro s r a r r s.

Generalized Depiction

igure -6 (ey Graph) ral s r l a r la o s s or -r ro o os s a r ’s s ly a o r. , , a r s ar s o , alo s ral ar al-r l s ra a oss l ar- r s. ’s o s r a y s l a a o s r s.

TABLE 9-6 THE SUPPLY SCHEDULE OF A COMPETITIVE FIRM CONFRONTED WITH THE COST DATA IN TABLE 9-4

Price	Quantity supplied	Maximum profit (+) or minimum loss (–)
$151	10	$+480
131	9	+299
111	8	+138
91	7	– 3
81	6	– 64
71	0	–100
61	0	–100

- r P_1 s lo r 's a ra ar a l os , so a s r r o ' o ra a all. a y s - l ll ro, as ll a all o r r s lo P_2.
- r P_2 s s al o a r- a ar a l os . r ll s ly Q_2 s o o (r $_2$) a s o r s o al ar a l os . s loss ll al s o al os . (ally, r o l r as o s o or s ly Q_2 s o o , ass ro s.)
- r P r ll s ly Q s o o o s s or -r loss s. a y o r r P_2 a P r ll s loss s y ro a s ly a y a (P) .
- r ll s r a a r P , r ll s ly Q s o o - (r), ar a or al ro o a o o ro . o al r ll s o r o al os , l a or al ro , a s r r (P) a o al os r ( ) ar sa .
- r P r ll r al a o o ro y ro a s ly- Q s o o . a , a a y r a o P r ll o a o- o ro y ro o o r (P) .

o a a o (P) rs o o s la ll $b, c, d,$ a e - r - a s a oss l ro r (o r al a s) a orr s o - a y a r o l s ly a a r (o or o al a s). s, o s s as s ar o slo s ly r o o r . o , oo, a a y s l o l ro a a y r lo a ra ar a l os ( ). a o l a or o o r 's ar- al- os r ly a o s a ra - ar a l - os r s s s or -r s ly r . r - , sol s o ar al- os r s s r 's **short-run supply curve**, lls s a o o o r ll s ly a a r a s r s o r s.

SHORT-RUN SUPPLY CURVE A curve that shows the quantities of the product a firm in a purely competitive industry will offer to sell at various prices in the short run.

Diminishing Returns, Production Costs, and Product Supply

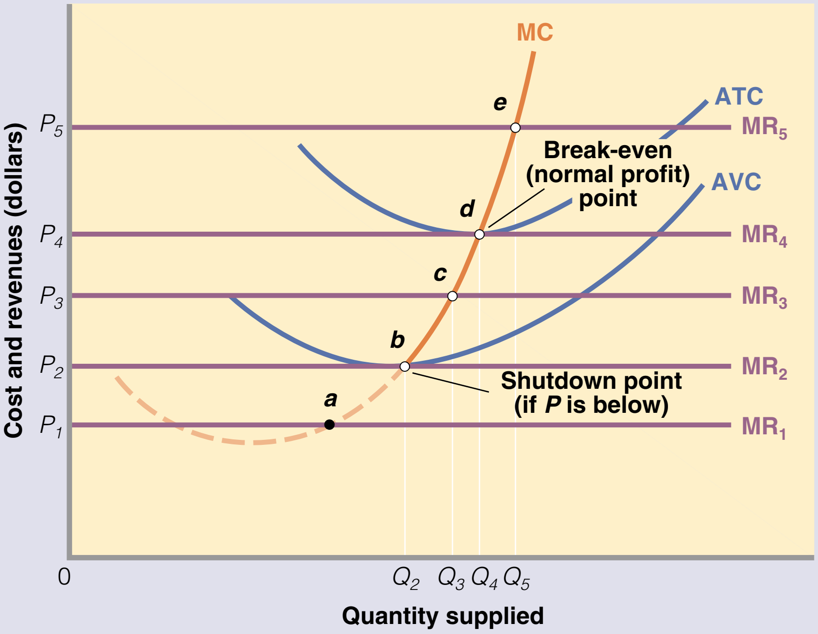
a o l s la o s r r s (a r), ro o os s, a ro s ly s or r . a s o la o s r r s, ar al os ally r s s as or s o o ar ro . a s ar al os r s s o , a r ly o r s s ss ly r r s o o a o ro a o al s o o .

o r ay o loo a s a r ro r s a ar al r o ra a r ly o r o a o . s s o r as s, r 's ar al os s r s as a r s l o la o s r r s. so o r a r o , s r als ro r a . ro o

Key Graph

FIGURE 9-6 THE P = MC RULE AND THE COMPETITIVE FIRM'S SHORT-RUN SUPPLY CURVE

Application of the $P = MC$ rule, as modified by the shutdown case, reveals that the (solid) segment of the firm's MC curve that lies above AVC is the firm's short-run supply curve. More specifically, at price P_1, $P = MC$ at point *a*, but the firm will produce no output because P_1 is less than minimum AVC. At price P_2 the firm will operate at point *b*, where it produces Q_2 units and incurs a loss equal to its total fixed cost. At P_3 it operates at point *c*, where output is Q_3 and the loss is less than the total fixed cost. With the price of P_4, the firm operates at point *d*; in this case the firm earns a normal profit because at output Q_4 price equals ATC. At price P_5 the firm operates at point *e* and maximizes its economic profit by producing Q_5 units.



QUICK QUIZ

1. Which of the following might increase product price from P_3 to P_5?
   a. An improvement in production technology
   b. A decline in the price of a substitute good
   c. An increase in the price of a complementary good
   d. Rising incomes if the product is a normal good

2. An increase in price from P_3 to P_5 would
   a. shift this firm's MC curve to the right.
   b. mean that MR_5 exceeds MC at Q_3 units, inducing the firm to expand output to Q_5.
   c. decrease this firm's average variable costs.
   d. enable this firm to obtain a normal, but not an economic, profit.

3. At P_4
   a. this firm has no economic profit.
   b. this firm will earn only a normal profit and thus will shut down.
   c. MR_4 will be less than MC at the profit-maximizing output.
   d. the profit-maximizing output will be Q_5.

4. Suppose P_4 is \$10, P_5 is \$15, Q_4 is 8 units, and Q_5 is 10 units. This firm's
   a. supply curve is elastic over the Q_4–Q_5 range of output.
   b. supply curve is inelastic over the Q_4–Q_5 range of output.
   c. total revenue will decline if price rises from P_4 to P_5.
   d. marginal-cost curve will shift downward if price falls from P_5 to P_4.

Answers

1. d; 2. b; 3. a; 4. b

a a s a a a r a r a y. a y s l as r as r r s o s o a r as ro r a s r o a ro .

Supply Curve Shifts

a r sa a a s s a ors as r s o ar a l s or olo y ll s ar al- os or s or -r s ly r o a lo ao . ll ls al, a a r as , or a l , o l s s ly r r - ar as ro or o al a s (l ar as ro r al a s), o s a r as s ly. larly, olo al ro r ss a r as s ro y o la o r o l s ar al- os or s ly r o ar as ro or o al a s (r ar as ro r al a s). s s r r s s a r as s ly.

Firm and Industry: Equilibrium Price

r s o lo o r ’s s or -r s ly r y a ly (*P*) r l . o r o ar o s oss l r s ll a ally ar l r r . ro a r o a a r ly o ar , l r r s r y o al, or ar , s ly a o al a . o r o al s ly, s ly s l s or r s o al o s ll rs s a . ol s 1 a a l - r a s ly s l or al o - r , as r a l - . o ass a r ar 1000 o - r s s s ry, all a sa o al a os s as s l r s ss . s ass o l s s al la ar s ly s l (ol s 2 a) y l ly a y-s l r s o s l r (ol 1) y 1000.

MARKET PRICE AND PROFITS

o r l r r a o , s o al-s ly a a s o ar o al- a a a. ’s ass a o al a s as s o ol s a a l - . y o ar o al a y s l a o al a y a a s oss l r s, r a l r r s $111 a l r a y s 000 s or s ry s or a o 1000 - al r s.

TABLE 9-7 FIRM AND MARKET SUPPLY AND MARKET DEMAND

(1) Quantity supplied, single firm	(2) Total quantity supplied, 1000 firms	(3) Product price	(4) Total quantity demanded
10	10,000	$151	4,000
9	9,000	131	6,000
8	*8,000*	*111*	*8,000*
7	7,000	91	9,000
6	6,000	81	11,000
0	0	71	13,000
0	0	61	16,000

ll s o o s o ar s ly a a a s a ro a l or a ro - a l s ry l ly ro r ($111) y o (s), a o al r o a r s $. o al os s $ 0, o y loo a ol a l - . $1 r s o o ro o a r . or s ry, o al o o ro s $1 ,000. s, , s a ro a l s ry.

o r ay o al la o o ro s o r r- ro y s ra a ra o al os ($.) ro ro r

($111) a l ly r (r- ro o $1 .2) y r 's - l r l lo o ( ). a o a a o o ro o $1 r r a $1 ,000 or s ry.

GRAPHICAL PORTRAYAL

r - s o s s a alys s ra ally. al s ly r s o a o 1000 al r s o o s s o as r - (a) ar s or o ally o o al-s ly r S Σ o r - ( ). o r o al- a r D, y l s l r r $111 a - l r a y (or s ry) 000 s. s l r r s a al ra l o al r a s, a r 's a r s r ly las- a l r r , as a y d r - (a). a s - al r s a r - a r, ar al-r r o s r 's a r d. s $111 r s a ra o al os a r 's l - r o o s, so r ar s a o o ro r r - s y r y ar a r - (a).

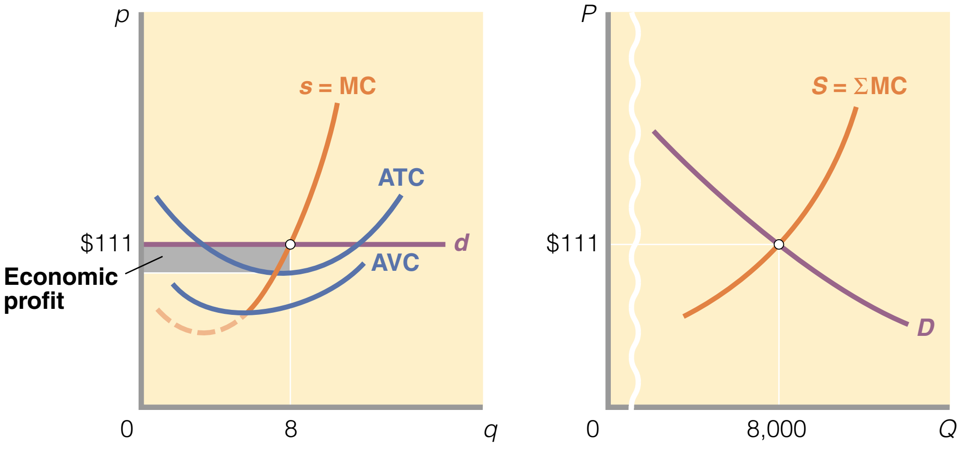
ss os s or ar a o o a , s a ra s r al a - l r s or r . ar as o s or a s or s r l s s o a s r or o al a y o a . or a a y o r s ry r as s ro y al r s o . o , oo, a r a ar al os s o o a , or a r ar a o o r, o l a s a o so a r - (a) r s l s r - or r - . r - (a) a ( ), s o r os s or r as a o l ro s or -r loss s.

FIRM VERSUS INDUSTRY

r - rs or s a o a arl r ro r s a a o *indi-id al* o r , s ly la s o all o ro rs *a ag o* ar a as r a o ro r . r all alla y o o os o , r s o o s s y r . l o o r , s ly a l l

FIGURE 9-7

The horizontal sum of the 1000 firms' individual supply curves (s) determines the industry supply curve (S). Given industry demand (D), the short-run equilibrium price and output for the industry are $111 and 8000 units. Taking the equilibrium price as given, the individual firm establishes its profit-maximizing output at eight units and, in this case, realizes the economic profit represented by the grey area.



(a) Single firm

(b) Industry

TABLE 9-8 OUTPUT DETERMINATION IN PURE COMPETITION IN THE SHORT RUN

Question	Answer
Should this firm produce?	Yes, if price is equal to, or greater than, minimum average variable cost. This means that the firm is profitable or that its losses are less than its fixed cost.
What quantity should this firm produce?	Produce where MR (= *P*) = MC; there, profit is maximized (TR exceeds TC by a maximum amount) or loss is minimized.
Will production result in economic profit?	Yes, if price exceeds average total cost (TR will exceed TC). No, if average total cost exceeds price (TC will exceed TR).

ra o o o al s ly, a o a r , s o s ly r s o all r s s ry o s s s ry s ly r , a a r o s a a or a ar o r . (*Key Question 4*)

QUICK REVIEW

- Profit is maximized, or loss minimized, at the output at which marginal revenue (or price in pure competition) equals marginal cost.
- If the market price is below the minimum average variable cost, the firm will minimize its losses by shutting down.
- The segment of the firm's marginal-cost curve that lies above the average-variable-cost curve is its short-run supply curve.
- Table 9-8 summarizes the MR = MC approach to determining the competitive firm's profit-maximizing output. It also shows the equivalent analysis in terms of total revenue and total cost.
- Under competition, equilibrium price is a given to the individual firm and simultaneously is the result of the production (supply) decisions of all firms as a group.

PROFIT MAXIMIZATION IN THE LONG RUN

s or r a s ro r s ar a s ry, a a , al- ra l la . r s ay s o s s a y a ro ro s o o s or r , y o o a s o l a r ass s a oo o s ss. y o ras , lo r r s alr a y a s ry a s r o a or o o ra r la a a s. or or a , r o r s s ry ay r r as or r as as r s r or s r s l a . o a o s lo -r a s s o y o r o l s o s o r s or -r o a r r a o .

Assumptions

a r s l y ass o s, o o a s o r o l s o s

1. *Entry and exit only* o ly lo -r a s s ry or o r s. or o r, or all s or -r a s s o o ra o s o lo -r a s s.

2. *Identical costs* ll r s s ry a al os r s. s ass - o l s s s ss a a ra , or r r s a , r , o a all o r r s s ry ar s larly a y a y lo -r a s s a o r.

. *Constant-cost industry* s ry s a o s a - os s ry, a s a ry or o r s o s o a r so r r s or, o s ly, lo a o s o a ra - o al- os r s o al r s.

The Goal of Our Analysis

as o l s o a o la s s r all lo -r a s s ar o l , ro r ll a ly al o, a ro o ll o r a , a r 's a ra o al os .

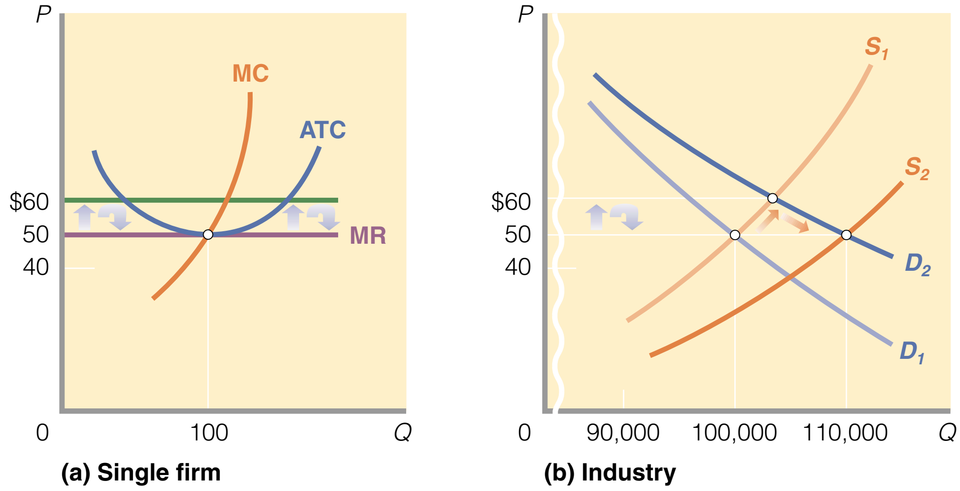
s o l s o ollo s ro o as a s (1) r s s ro s a a o loss s, a (2) r r o o , r s ar r o r a l a a s- ry. ar r ally s a ra o al os s, r s l o o ro - s ll a ra r s o s ry, s s ry a s o ll r as s ly l r s ro a o o al y a ra o al os . o rs ly, r s ally l ss a a ra o al os , r s l loss s ll a s r s o l a s ry. s y l a , o al s ly ll l , r r a o al y a ra o al os .

Long-Run Equilibrium

o s r a ra r a r ly o s ry a s ally lo - r l r . s r s r r s r - (a), r a r a a ra o al os ar al a $ 0. o o ro r s ro s ry s l r or a r s a s r s o y or r s o r or o l a . s r s ar ar or al ro s, , r all, ar l r os r s. $ 0 ar r s r r - ( ) y ar

FIGURE 9-8 TEMPORARY PROFITS AND THE RE-ESTABLISHMENT OF LONG-RUN EQUILIBRIUM IN A REPRESENTATIVE FIRM (PANEL A) AND THE INDUSTRY (PANEL B)

A favourable shift in demand (D_1 to D_2) will upset the original industry equilibrium and produce economic profits. But those profits will cause new firms to enter the industry, increasing supply (S_1 to S_2) and lowering product price until economic profits are once again zero.



(a) Single firm (b) Industry

or s ry a D_1 a s ly S_1. (S_1 s a s or -r s ly r ll lo lo -r s ry s ly r o r s ss o .) s s o o a y a s o o ra s, l r o s ry s 100,000, l l r o or s l r s 100. all r s s ry ar al, r s 1000 r s (100,000/100).

ENTRY ELIMINATES ECONOMIC PROFITS

’s s lo -r l r r - a s a a s. os a a o s r as s r as s ro a ro D_1 o D_2. r ll r s o $ 0, as r a rs o o D_2 a S_1, a r ’s ar al- r r ll s ar o $ 0. s $ 0 r s r ’s a ra o al os o $ 0 a o 100, r a a o o ro o $10 r . s o- o ro ll l r r s o s ry. o ra s ll ly r - a r s o rs ll s ro l ss ros ro s s r s.

s r s r, ar s ly o ro r as s, s ro r lo $ 0. o o ro s rs s , a ry o s l s or -r s - ly r as s o S_2. ar r alls o $ 0, as o s ar al r or r . r a a ra o al os ar a a al a $ 0. o o ro s a s y oos a a l a , a , as a r s l , r o s or or r s o r s ry as sa ar . o -r l - r as r s or .

s r r - (a) a ( ) a o al a y s l s o 110,000 s a a r s ro 100 s. o 1100 r s ra r a or al 1000 o la s ry. o o ro s a a ra 100 or r s.

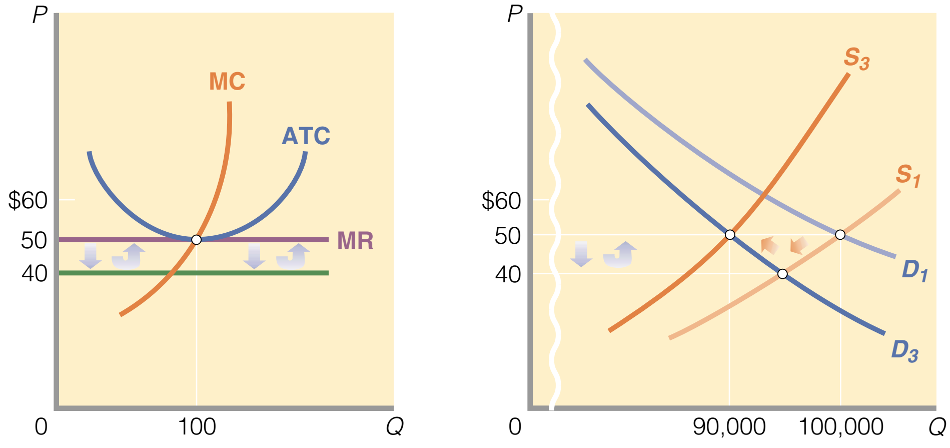
<economics.about.com/money/economics/library/weekly/aa010900.htm> The great Pokémon crash of 2000: Supply and demand for the grade school set

EXIT ELIMINATES LOSSES

o l ’s o s r a s o os r o . r - ( ) r s S_1 a D_1 s sa al lo -r l r s a o as o r r o s a alys s, l $ 0 r .

FIGURE 9-9 TEMPORARY LOSSES AND THE RE-ESTABLISHMENT OF LONG-RUN EQUILIBRIUM IN A REPRESENTATIVE FIRM (PANEL A) AND THE INDUSTRY (PANEL B)

An unfavourable shift in demand (D_1 to D_3) will upset the original industry equilibrium and produce losses, but those losses will cause firms to leave the industry, decreasing supply (S_1 to S_3) and increasing product price until all losses have disappeared.



(a) Single firm

(b) Industry

os o s r a l s ro D_1 o D . s l or s ar- r a ar al r o o $ 0, a ro o ro a l a o $ 0. r s l loss s ll r s o l a s ry. r o rs ll s a or al ro ls r ra r a a lo - or al ro s (loss) o o ro . as a al ars o , so r s ll s ly o o o s ss. s s o s o r s ro s, o r, s ry s ly r as s, s r ro $ 0 o ar $ 0. oss s o a or r s l a s ry l s ly r s s o S . s a s, r s a a $ 0, s al o a ra o al os . oss s a l a a lo -r l r s r s or . r - (a), o al a y s l s o 0,000 s a a r s ro- 100 s. ly 00 r s, o or al 1000, o la s ry. oss s a or 100 r s o .

o ay a o a a s s s o o r s ll l a s ry loss s o r y ass a all r s a al os r s. r al orl , o o rs , r r r al al s r. r so r r s a olo y ar sa or all r s, r or r r rs o r r os s a , r or , ar rs o l a a s ry a l s. larly, r s l ss ro la o r or s ll r- os ro rs a l ly a a s o a s ry a r as s.

a o r a a r a oal r a alys s r s a o - o , r ry a o r s, l a s o o ro s or loss s y a s r o al lo -r a ra o al os . a o , s o - o or s r s o s l o l ls a a ra o al os s .

LONG-RUN SUPPLY CURVE A curve that shows the prices at which a purely competitive industry will make various quantities of the product available in the long run.

Long-Run Supply for a Constant-Cost Industry

l o o r a alys s as al lo r , a o a ar s ly r s r s - ( ) a - ( ) ar s or -r r s. a s ara r o **long-run supply curve** o a o s ry a alys s o s s o ar a a s r. r al a or r s , a y, a a s r o r s s ry ll a o os s o al r s s ry.

CONSTANT-COST INDUSTRY An industry in which the entry of new firms has no effect on resource prices and thus no effect on production costs.

CONSTANT-COST INDUSTRY

o r a alys s o lo -r o l r ass a s ry r s ss o as a **constant-cost industry**, a s a s ry a - s o or o ra o ll o a r so r r s or ro o os s. Gra ally, a s a ry or o r s o s o s lo -r r s o al r s. s s as s ry's a or r so r s s s all r la o o o al a or os r so r s s ry a a or o - ra o s a ly a r so r r s a os s.

PERFECTLY ELASTIC LONG-RUN SUPPLY

a o s lo -r s ly r o a o s a - os s ry loo l a s r s o a o r r o s a alys s. r sa a ry a o r s a s s ry o al ays r s ro r a o s or al l l, r s s al o o s a . ally, s o r a s ry o l s ly 0,000, 100,000, or 110,000 s o o - , all a a r o $ 0 r . o r or s, lo -r s ly o a o s a - os s ry s r ly las .

<www.theshortrun.com/classroom/glossary/macro/marketequilibrium.html> Market equilibrium

s s o s ra ra ally r -10, s s a a ro r s -
a - . os s ry a s or ally D_1, s ry o s Q_1 (100,000
s), a ro r s P_1 ($ 0). s s a o , ro r - , s o o lo -
r l r . sa a a r as s o D_2, s s l -
r , r s l o o ro sa ra r s. a s s sa o sa - os
s ry, ry o sa s ry o a s l r s r a
o o l l o a , s a r P_2 ($ 0) a
o Q_2 (110,000).

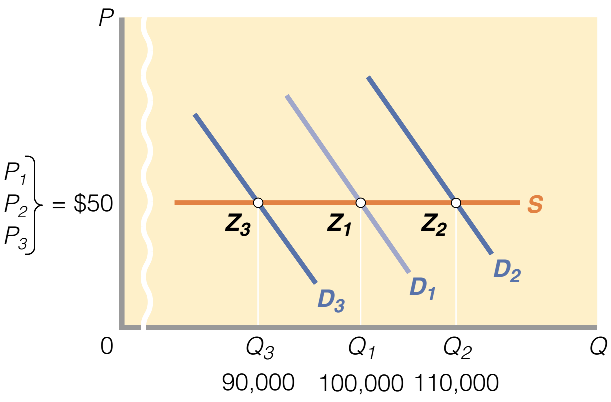
ro r - , sa a a l ar a ro D_1 o D a s s
a o r sa l a ly r s or s l r a r P ($ 0) a o Q
(0,000 s). o s Z_1, Z_2, a Z r -10 r r s s r
r a y o a o s. l or r o all s o ss o s
ar o s r a y o a o s a r s o l ro y a o
o a all s r a s s o a s a . s l or r s
s ry's lo -r s ly r . a o s a - os s ry s r (s ra
l) s or o al, as r -10, s r r s r ly las s ly.

Long-Run Supply for an Increasing-Cost Industry

INCREASING-COST INDUSTRY An industry in which the entry of new firms raises the prices for resources and thus increases their production costs.

o s a - os s r s ar a s al as . os s r s ar **increasing-cost**
industries, r s' r s s ar as s ry a s a
o ar as s ry o ra s. s ally, ry o r s ll r as
r so r r s, ar larly so s r s s s al r so r s os s -
l s ar o r a ly r as r s o s o a r as r so r a . r
r so r r s r s l r lo -r a ra o al os s or all r s s-
ry. s r os s a s ar s s a r 's lo -r r .
s, a r as ro a r s l s o o ro s a
a ra s r s o a r as - os s ry, a o- ay s or s o l -
a os ro s. s or , ry o r s r as s ar s ly a
lo rs ar r , o r r s s ar . o rall
r s l s a r- a -or al l r r . s ry ro s a lar r
o a a r ro r a s s ry a s o as r as

FIGURE 9-10



Because the entry or exodus of firms does not affect resource prices or, therefore, unit costs, an increase in demand (D_1 to D_2) causes an expansion in industry output (Q_1 to Q_2) but no alteration in price ($50). Similarly, a decrease in demand (D_1 to D_3) causes a contraction of output (Q_1 to Q_3) but no change in price. This means that the long-run industry supply curve (S) is horizontal through points Z_1, Z_2, and Z_3.

r so r r sa a ra o al os . o a , lo r , ro r s o r .

r a ro ll s l a a r r , lo -r s ry s - ly r s slo . s a o s ly 0,000, 100,000, or 110,000 s a sa r o $ 0, a r as - os s ry s ly 0,000 s a $, 100,000 s a $ 0, a 110,000 s a $. r r s r r o or ro o , a s os s r o o r as as ro o r s s. s o s r -11. r al ar a s D_1 a s ry r a o ar P_1 ($ 0) a Q_1 (100,000 s), r s ly, a l r o Y_1. r as a o D_2 s s s l r a l a s o o o ro s. r s r s ry, r as o ar s ly a ro o os s o al r s. r s s a l s a o Y_2, r P_2 s $ a Q_2 s 110,000 s.

o rs ly, a l a ro D_1 o D a s ro o ro a l a a s s r s o l a s ry. r s l l r so r r s r s a ra o al os o ro o or r s a s ay. l r r s s a l s a so l l lo or al r , say, a o Y , r P s $ a Q s 0,000 s. o s r l r os - o s, r slo lo -r s ly r S r -11.

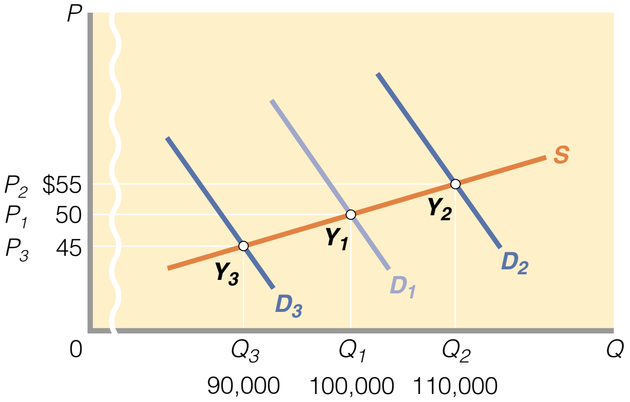
Long-Run Supply for a Decreasing-Cost Industry

DECREASING-COST INDUSTRY An industry in which the entry of firms lowers the prices of resources and thus decreases production costs.

a **decreasing-cost industry**, a r r s lo r os s as s ry a s. rso al o r s ry s a a l . s a or rso al o rs r as , a a r rs o o rs r s ry a r a ly r as r so r a or o o s s o l (or a - l , ory s, ar r s, o ors, a o ra so ar). a ro o o os o o s a l ro rs o os s o a s s a al o o s o s al . r as ro o os s o o o s r r r s, r a ly lo r o r a a r rs' a ra os s o ro o . s ly o rso al o rs r as y or a a , a r o rso al o rs l .

FIGURE 9-11

In an increasing-cost industry the entry of new firms in response to an increase in demand (D_3 to D_1 to D_2) will bid up resource prices and thereby increase unit costs. As a result, an increased industry output (Q_3 to Q_1 to Q_2) will be forthcoming only at higher prices ($55 > $50 > $45). The long-run industry supply curve (S) therefore slopes upward through points Y_3, Y_1, and, Y_2.



r yo or or a alys s rly r -11 os o a lo - r s ly r o a r as - os s ry s *do n lo ing*. (***Key Question 6***)

PURE COMPETITION AND EFFICIENCY

The Effectiveness of Markets

r al oal s a r s or la r o o o y. r a r ly o s ry s a o s a - os s ry or a r as - os s- ry, al lo -r l r os o s o all r s a sa as ara - r s s r la o o o y. ss o **igure -12 (ey Graph)**, r (a ar al r) lls l r s al o a ra o al os *P* (a) . ar al- os r rs s a ra - o al- os r a s o , ar al os a a ra o al os ar al . s, lo -r l r a l l al y s s *P* (a) .

s r l al y lls s a al o a o r ay r al o- o ro or loss s or r , ll ar o ly a or al ro y ro a or a (*P*) r l lo r . lso, s r l al- y s s s r a o l s o s o r a so al s a o r - y o a r ly o o o y.

o o s s a r a , s o al a o s s ss la r a rs, a al r ly o o o y l a s o a s o so y's s ar r so r s. o ar o o y s s l a o s o r so r s a a la l o so y a ay a a s sa s a o o o s rs. s o s ra a r 2, s o l r so r s r r s o ro - y a allo a y.

Productive efficiency r r s a oo s a s r s ro l as os ly ay. **Allocative efficiency** r r s a r so r s a or o a o r s a s r s so as o y l o ro s a s r s os a y so y (o s rs). llo a y as r al s oss l o al r o os o o o al o a a a a or so y. 's loo a o ro a allo a y ar a r r ly o o s.

PRODUCTIVE EFFICIENCY The production of a good or service in the least costly way.

ALLOCATIVE EFFICIENCY When resources are apportioned among firms and industries to obtain the mix of products and services most wanted by society.

Productive Efficiency: P = Minimum ATC

lo r , r o o or s r s o ro a a ra o al os o ro o a o ar a r a s s o s s a os , a ly a o ra l s a o or o s r. l ss r s s s -a a la l (l as - os) ro o o s a o a o s o s, y ll o s r . a r ly, a o o r so r s ll s o ro a y ar lar o . 's s os a o s rs.

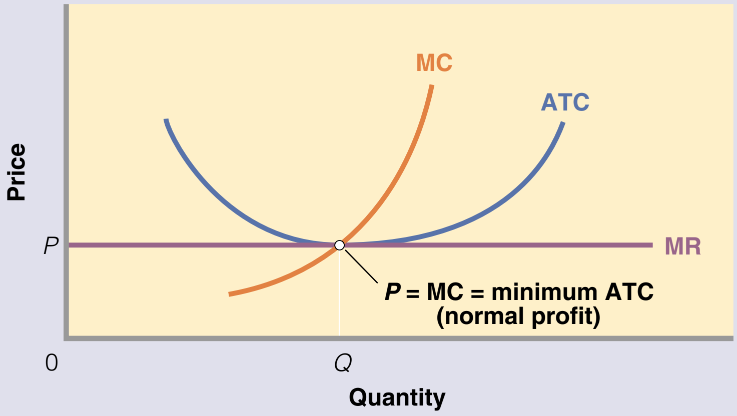
al l r os o s o r - (a), a r - r s ry s ro 100 s (say, r loa s) o o y s $ 000 (al o a ra o al os o $ 0 × 100 s) or o r so r s. o r ro a sa o a a o al os o , say, $ 000, s r so r s o l s ly. o y o l a a loss o $2000 or o al r a ro s. s loss a o a r o o s r 's loss o $2000 o l r r r or s os s or o o o s ss.

o , oo, a o s rs ro ro y y ay lo - s ro r oss l r r a l olo y a os o o s.

Key Graph

FIGURE 9-12 THE LONG-RUN EQUILIBRIUM POSITION OF A COMPETITIVE FIRM: P = MC = MINIMUM ATC

The equality of price and minimum average total cost indicates that the firm is using the most efficient technology, is charging the lowest price, *P*, and is producing the greatest output, *Q*, consistent with its costs. The equality of price and marginal cost indicates that resources are being allocated in accordance with consumer preferences.



QUICK QUIZ

1. We know this firm is a price-taker because
- a. its MC curve slopes upward.
- b. its ATC curve is U-shaped.
- c. its MR curve is horizontal.
- d. MC and ATC are equal at the profit-maximizing output.

2. This firm's MC curve is rising because
- a. it is a price-taker.
- b. of the law of diminishing marginal utility.
- c. wage rates rise as output expands.
- d. of the law of diminishing marginal returns.

3. At this firm's profit-maximizing output
- a. total revenue equals total cost.
- b. it is earning an economic profit.
- c. allocative, but not necessarily productive, efficiency is achieved.
- d. productive, but not necessarily allocative, efficiency is achieved.

4. The equality of *P*, MC, and minimum ATC
- a. occurs only in constant-cost industries.
- b. encourages entry of new firms.
- c. means that the right goods are being produced in the right ways.
- d. results in a zero accounting profit.

Answers

1. c; 2. d; 3. a; 4. c

Allocative Efficiency: $P = MC$

ro y alo o s o s r allo a o o r so r s. as - os ro o s s o ro so y r oo s oo s a o s rs a os . or a s o a o ar sys o s s a , s s ss so al a o ro r s. r ar o r al l s r .

1. o y r o a y ro s so y's as r o r la or o a a o al o a ro or a l , rs. o, r o a o rs s ar al r ro a o ro .

2. larly, r all a o o or y os , s a ar al os o a a o al o a ro as r s al , or r la or , o o r oo s sa r o o a . ro rs, r so r s ar ra a ay ro ro o r oo s. ar al os o ro a o rs as r s so y's sa r o os o r oo s.

o rs a y *P* s allo a y, l 's rs loo a s a o s r a s o as .

UNDERALLOCATION: $P > MC$

r o o , a r ll r al a oss l ro o ly y ro- r r als ar al os (r -12). ro r rs s a (a s *P*) s y l s l ss a a ro . also a ls, ro so y's o , a rallo a o o r so r s o s ro . a a r s ll s ar al os a s a so y al s a o al s o rs or ly a al r a ro s a ro r a r so r s o l o r s ro .

o ll s ra , r or ar al o a o rs s $100 a s ar al os s $ 0, ro a a o al ll a s a r as o al ll- o $ 0. o y ll a rs al a $100, l al r a ro s sa r y allo a or r so r s o rs o l al a o ly $ 0. r so y a a so al a $100 y so - al a $ 0, al allo a o o r so r s s a .

OVERALLOCATION: $P < MC$

or s lar r aso s, ro o o rs s o l o o yo o a r als ar al os . o ro r s (a s *P*) o l y l l ss a a ro or ro r a , ro - o o so y, o l a l a o rallo a o o r so r s o rs. ro - rs a l l r ar al os s r (or ar al) a s a so y s ro rs y sa r al r a oo s a so y al s or ly.

or a l , r o a o rs s $ a s ar al os s $100, ro o o l ss o rs o l r s l a r as so y's o al ll- o $2 . o y o l los rs al a $, r allo a r r so r s o r s al r a s s o l r as o o so o r oo al a $100. r so y s a l o so o l ss r al r r or so o r a r al , or - al allo a o o r so r s s a .

EFFICIENT ALLOCATION

r o l s o s a r o o , ro - o a r s ro a oo or s r o o r r (ar al) a ar al os ar al, so y's r so r s ar allo a ly. a s ro o o a al o las s al o al o al r a oo s sa r y s ro o . o al r ro o o rs o l r o - s r sa s a o . o ro rs yo *P* o o l sa r al r a oo s os al o so y s a o ra rs. o ro- rs s or o *P* o o l sa r rs a so y al- s or a al r a oo s s r so r s o l ro . (*Key Question 7*)

DYNAMIC ADJUSTMENTS

r ra r o r ly o ar s s ra l y or s or y sr y a s o o y. a o s r as s, r so r s l s, or olo y ll a o a ally s o o a ro r a r al - s o r so r s. or a l , s os a rs a l s o ra- a ally or o lar. rs , r o rs ll r as so a , a rr o , r o rs ll s ar al os . s o y ll los , r r ll r a o o ro s r s- ry a s la s a s o . ro a l y o rs ll r s ry o r so r s a ay ro o l ss r ss s s, say a r lo s. a s o o s ry ll o ly r o rs a s ar- al os ar al a s, allo a y as r s or .

larly, a a s ly o a ar lar r so r or a l , l la o r rs o rs or a ro o ll s a s r ar al- os al y y r ra s or lo r ar al os . r s l - al y ll a s s ss a a rs, r rs ro or a o - loss, o r allo a r so r s l r o a a als ar al os . so o , y ll orr a y y allo a o o r so r s a or - al a ay a orar ly os o o o y.

THE INVISIBLE HAND REVISITED

ally, ly allo a o o r so r s a a r ly o o - o y ro o s o s a o a s s ss s a r so r s l rs s o r- r r s l - r s . s l a (a r) s a or a o ar sys . o sys o o ly a s ro s or al ro rs r a s a a r o r so r allo a o a a s o s r sa - s a o . s l a s or a s r a r s s o ro rs a ay a s lly a or so y's r s s s ar r so r s ly.

QUICK REVIEW

- In the long run, the entry of firms into an industry will compete away any economic profits, and the exit of firms will eliminate losses so that price and minimum average total cost are equal.
- The long-run supply curves of constant-cost, increasing-cost, and decreasing-cost industries are horizontal, upsloping, and downsloping, respectively.
- In purely competitive markets both productive efficiency (price equals minimum average total cost) and allocative efficiency (price equals marginal cost) are achieved in the long run.

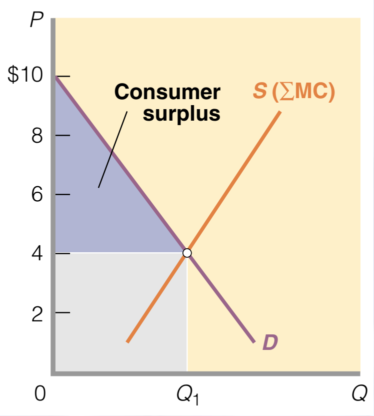
The LAST word

PURE COMPETITION AND CONSUMER SURPLUS

Pure competition provides consumers with the largest utility surplus that is consistent with keeping the product in production.

In almost all markets, consumers collectively obtain more utility (total satisfaction) from their purchases than the amount of their expenditures (product price × quantity). This surplus of utility arises because some consumers are willing to pay more than the equilibrium price but need not do so.

Consider the market for oranges depicted in the figure below. The demand curve *D* tells us that some consumers of oranges are willing to pay more than the $4 equilibrium price per bag. For example, assume Bob is willing to pay $9; Barb, $8; Bill, $7; Bart, $6; and Brent, $5. Betty, in contrast, is unwilling to pay one penny more than the $4 equilibrium price.



There are many other consumers besides Bob, Barb, Bill, Bart, and Brent in this market who are willing to pay prices above $4. Only Betty pays exactly the price she is willing to pay; the others receive some amount of utility beyond their expenditures. The difference between that utility value (measured by the vertical height of the points on the demand curve) and the $4 price is called *consumer surplus*. When we add together each buyer's utility surplus, we obtain the consumer surplus for all the consumers in the market. To get the Q_1 bags of oranges, consumers collectively are willing to pay the sum of the amounts represented by the blue triangle and grey rectangle. However, they only have to pay the amount represented by the grey rectangle. The blue triangle thus represents consumer surplus.

A glance at the figure shows that the amount of consumer surplus—the size of the blue triangle—would be less if the sellers could charge some price above $4. As just one example, at a price of $8, only a very small triangle of consumer surplus would exist. But purely competitive firms cannot charge $8 because they are price-takers. Any firm that charged a price above $4 would immediately lose all its business to the other firms.

We know that in pure competition the equilibrium price equals the marginal cost of the Q_1 bags of oranges. And, since we are assuming that entry and exit have resulted in this price being equal to the lowest average total cost, each seller is earning only a normal profit. By definition, this profit is just sufficient to continue production of oranges.

The principle that emerges is this: By establishing the lowest price consistent with continued production, pure competition yields the largest sustainable amount of consumer surplus. (For a more detailed treatment of consumer surplus, see Chapter 12.)

CHAPTER SUMMARY

1. Economists group industries into four models based on their market structures: (a) pure competition, (b) pure monopoly, (c) monopolistic competition, and (d) oligopoly.
2. A purely competitive industry consists of a large number of independent firms producing a standardized product. Pure competition assumes that firms and resources are mobile among different industries.
3. In a competitive industry, no single firm can influence market price, which means that the firm's demand curve is perfectly elastic and price equals marginal revenue.
4. We can analyze short-run profit maximization by a competitive firm by comparing total revenue and total cost or by applying marginal analysis. A firm maximizes its short-run profit by producing the output at which total revenue exceeds total cost by the greatest amount.
5. Provided price exceeds minimum average variable cost, a competitive firm maximizes profit or minimizes loss in the short run by producing the output at which price or marginal revenue equals marginal cost. If price is less than average variable cost, the firm minimizes its loss by shutting down. If price is greater than average variable cost but is less than average total cost, the firm minimizes its loss by producing the P = MC output. If price also exceeds average total cost, the firm maximizes its economic profit at the P = MC output.
6. Applying the MR (= P) = MC rule at various possible market prices leads to the conclusion that the segment of the firm's short-run marginal-cost curve that lies above the firm's average-variable-cost curve is its short-run supply curve.
7. In the long run, the market price of a product will equal the minimum average total cost of production. At a higher price, economic profits would cause firms to enter the industry until those profits had been competed away. At a lower price, losses would force the exit of firms from the industry until the product price rose to equal average total cost.
8. The long-run supply curve is horizontal for a constant-cost industry, upsloping for an increasing-cost industry, and downsloping for a decreasing-cost industry.
9. The long-run equality of price and minimum average total cost means that competitive firms will use the most efficient technology and charge the lowest price consistent with their production costs.
10. The long-run equality of price and marginal cost implies that resources will be allocated in accordance with consumer tastes. The competitive price system will reallocate resources in response to a change in consumer tastes, in technology, or in resource supplies and will thereby to maintain allocative efficiency over time.

TERMS AND CONCEPTS

pure competition, p. 214
pure monopoly, p. 214
monopolistic competition, p. 214
oligopoly, p. 214
imperfect competition, p. 214
price-taker, p. 215
average revenue, p. 216
total revenue, p. 217
marginal revenue, p. 217
break-even point, p. 219
MR = MC rule, p. 221
short-run supply curve, p. 227
long-run supply curve, p. 234
constant-cost industry, p. 234
increasing-cost industry, p. 235
decreasing-cost industry, p. 236
productive efficiency, p. 237
allocative efficiency, p. 237

STUDY QUESTIONS

1. Briefly state the basic characteristics of pure competition, pure monopoly, monopolistic competition, and oligopoly. Under which of these market classifications does each of the following most accurately fit? (a) a supermarket in your home town; (b) the steel industry; (c) a Satskatchewan wheat farm; (d) the chartered bank in which you or your family has an account; (e) the automobile industry. In each case justify your classification.

2. Strictly speaking, pure competition has never existed and probably never will. Then why study it?

3. **KEY QUESTION** Use the following demand schedule to determine total revenue and marginal revenue for each possible level of sales:

Product price	Quantity demanded	Total revenue	Marginal revenue
$2	0	$______	
2	1	______	$______
2	2	______	______
2	3	______	______
2	4	______	______
2	5	______	______

a. What can you conclude about the structure of the industry in which this firm is operating? Explain.

b. Graph the demand, total-revenue, and marginal-revenue curves for this firm.

c. Do the demand and marginal-revenue curves coincide? If so, why? If not, why not?

d. "Marginal revenue is the change in total revenue associated with additional units of output." Explain in words and graphically, using the data in the table.

4. **KEY QUESTION** Assume the following cost data are for a purely competitive producer:

Total product	Average fixed cost	Average variable cost	Average total cost	Marginal cost
0				
1	$60.00	$45.00	$105.00	$45
2	30.00	42.50	72.50	40
3	20.00	40.00	60.00	35
4	15.00	37.50	52.50	30
5	12.00	37.00	49.00	35
6	10.00	37.50	47.50	40
7	8.57	38.57	47.14	45
8	7.50	40.63	48.13	55
9	6.67	43.33	50.00	65
10	6.00	46.50	52.50	75

a. At a product price of $56, will this firm produce in the short run? Why or why not? If it does produce, what will be the profit-maximizing or loss-minimizing output? Explain. What economic profit or loss will the firm realize per unit of output?

b. Answer the questions in 4a assuming product price is $41.

c. Answer the questions in 4a assuming product price is $32.

d. In the table below, complete the short-run supply schedule for the firm (columns 1 and 2) and indicate the profit or loss incurred at each output (column 3).

(1) Price	(2) Quantity supplied, single firm	(3) Profit (+) or loss (–)	(4) Quantity supplied, 1500 firms
$26	______	$______	______
32	______	______	______
38	______	______	______
41	______	______	______
46	______	______	______
56	______	______	______
66	______	______	______

e. Explain: "That segment of a competitive firm's marginal-cost curve that lies above its average-variable-cost curve constitutes the short-run supply curve for the firm." Illustrate graphically.

f. Now assume that there are 1500 identical firms in this competitive industry; that is, that there are 1500 firms, each of which has the cost data shown in the table. Complete the industry supply schedule (column 4).

g. Suppose the market demand data for the product are as follows:

Price	Total quantity demanded
$26	17,000
32	15,000
38	13,500
41	12,000
46	10,500
56	9,500
66	8,000

What will be the equilibrium price? What will be the equilibrium output for the industry?

for each firm? What will profit or loss be per unit? per firm? Will this industry expand or contract in the long run?

5. Why is the equality of marginal revenue and marginal cost essential for profit maximization in all market structures? Explain why price can be substituted for marginal revenue in the MR = MC rule when an industry is purely competitive.

6. KEY QUESTION Using diagrams for both the industry and a representative firm, illustrate competitive long-run equilibrium. Assuming constant costs, employ these diagrams to show how (a) an increase and (b) a decrease in market demand will upset that long-run equilibrium. Trace graphically and describe in words the adjustment processes by which long-run equilibrium is restored. Now rework your analysis for increasing-cost and decreasing-cost industries and compare the three long-run supply curves.

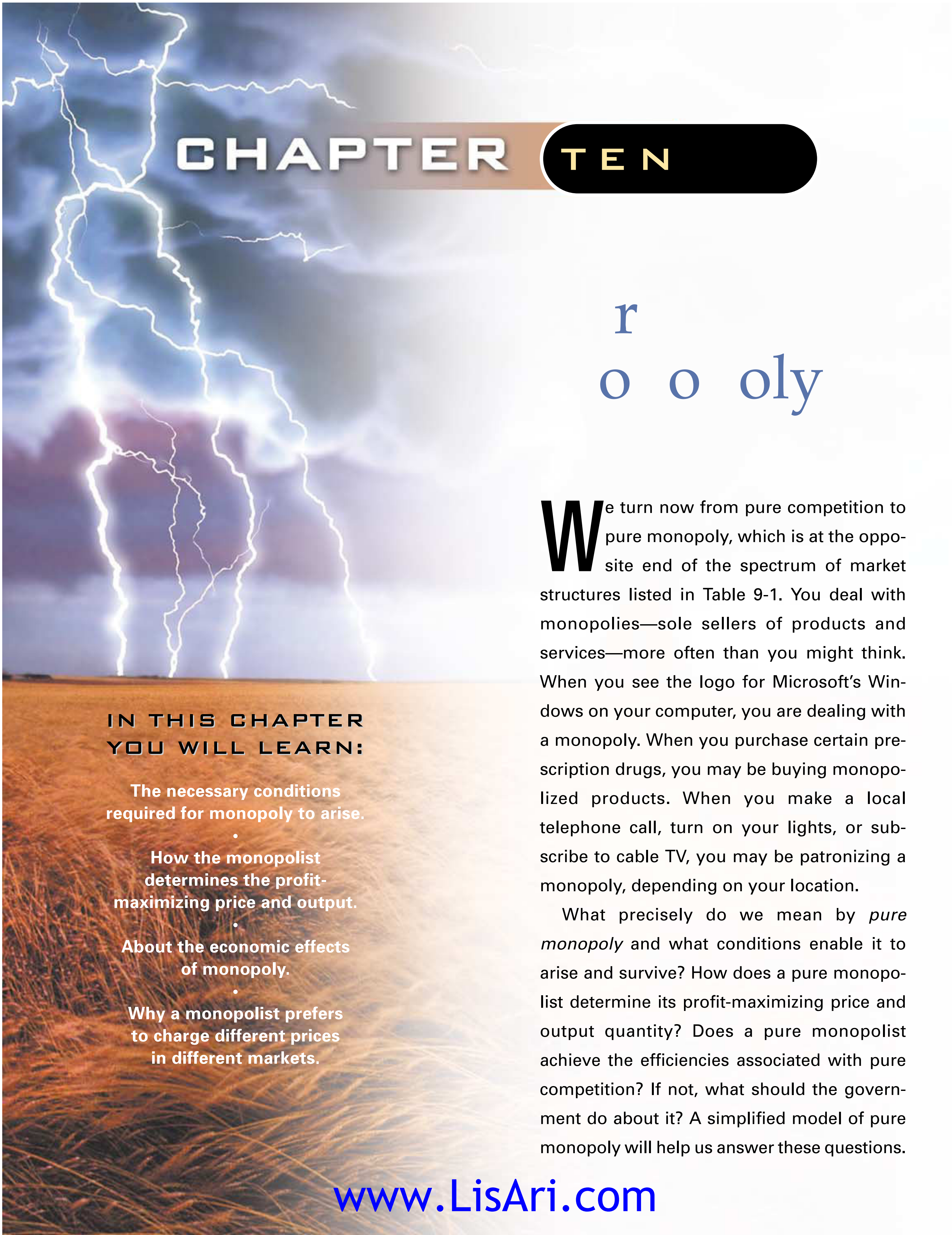
7. KEY QUESTION In long-run equilibrium, *P* = minimum ATC = MC. Of what significance for economic efficiency is the equality of *P* and minimum ATC? the equality of *P* and MC? Distinguish between productive efficiency and allocative efficiency in your answer.

8. **(The Last Word)** Suppose that improved technology causes the supply curve for oranges to shift rightward in the market discussed in this The Last Word (see the figure there). Assuming the location of the demand curve does not change, what will happen to consumer surplus? Explain why.

INTERNET APPLICATION QUESTIONS

1. Suppose that you operate a purely competitive firm that buys and sells foreign currencies. Also suppose that yesterday, your business activity consisted of buying 100,000 Swiss francs at the market exchange rate and selling them for a 3 percent commission. Go to the Bank of Canada's website <www.bankofcanada.ca> and select, in order, Currency and Currency Converter. What was your total revenue in Canadian dollars yesterday? (Be sure to include your commission.) Why would your profit for the day be considerably less than this total revenue?

2. In a purely competitive market, individual firms produce homogeneous products and exert no significant control over product price. The Alberta government at <www.agric.gov.ab.ca/economic/market/mpmod05.html> provides a brief overview of how a commodity exchange functions and has links to the main commodity exchanges in North America. Visit the Winnipeg Commodity Exchange and select "Daily Market Summary." Which of the main crops has had the largest price movement and why?



CHAPTER TEN

r
o o oly

IN THIS CHAPTER YOU WILL LEARN:

The necessary conditions required for monopoly to arise.

•

How the monopolist determines the profit-maximizing price and output.

•

About the economic effects of monopoly.

•

Why a monopolist prefers to charge different prices in different markets.

We turn now from pure competition to pure monopoly, which is at the opposite end of the spectrum of market structures listed in Table 9-1. You deal with monopolies—sole sellers of products and services—more often than you might think. When you see the logo for Microsoft's Windows on your computer, you are dealing with a monopoly. When you purchase certain prescription drugs, you may be buying monopolized products. When you make a local telephone call, turn on your lights, or subscribe to cable TV, you may be patronizing a monopoly, depending on your location.

What precisely do we mean by *pure monopoly* and what conditions enable it to arise and survive? How does a pure monopolist determine its profit-maximizing price and output quantity? Does a pure monopolist achieve the efficiencies associated with pure competition? If not, what should the government do about it? A simplified model of pure monopoly will help us answer these questions.

PURE MONONPOLY

PURE MONOPOLY An industry in which one firm is the sole seller of a product or service.

Pure monopoly s s a s l r s sol ro r o a ro or r ar o los s s s. r ar a ara r s s o r o o oly.

- ***Single seller*** r , or a sol , o o oly s a s ry a s l r s sol ro r o a s oo or sol s l r o a s r r a s ry ar sy o y o s.
- ***No close substitutes*** r o o oly's ro s a r ar o los s s s. o s r o oos s o o y o o ol ro s o o .
- ***Price-maker*** r o o ol s o rols o al a y s l a s as o s ra l o rol o r r s a *ice-make* , l r o or a as o s o rol a , r or , s a *ice- ake* . r o o ol s o ro s s al o ar -slo ro a r . a a s ro r y a a y o ro s l s. o o ol s ll s s o r r s a a a o s o o so.
- ***Blocked entry*** r o o ol s as o a o ors a s r- a arr rs o al o ors ro r s ry. os ar- r rs ay o o , olo al, l al, or o so o r y , ry s o ally lo r o o oly.

Examples of Monopoly

a l s o *e* o o oly ar r la ly rar , r ar a y a l s o l ss r or s. os s, o r -o or o r -r la l l s a ral as a l r o a s, a r o a y, a l o - a y, a lo al l o o a y ay o o ol s or r ally so. ro ss o al s or s a s ar , a s s , o o ol s a s y ar sol s l rs o s s r s lar o ra ar as. a o s, a s l a or-l a a a s or s r s a lar a a a y. yo a o s a l a or-l a as all a oro o or o r al, yo s a ro l ays or os, r s ly. r o ra o o ol s s . or a l , a s all o ay s r y o ly o a rl or ra lroa . a s all, sola o y, lo al a , o a r , or oo s or ay a ro - a a o o oly.

o rs , so o o al os al ays s s. a ll l s o s a s s - or a l , a a a r so all s a s s or ro ss o al as all. o ra sys a s s or o s. s s s s ar y - ally r or os ly or so ay l ss a al .

<money.york.pa.us/Articles/Microsoft.htm> Predatory Pricing: Microsoft's Modus Operandi

Dual Objectives of the Study of Monopoly

a o a r o o oly o o ly or s o sa also a s s a s y ll l yo rs a or o o ar s r r s o o o o- l s o o a ol o oly, o s ss a r 11. s o ar s r r s o , r r s, ara r s s o r o o a r o o oly.

BARRIERS TO ENTRY

BARRIERS TO ENTRY Anything that artificially prevents the entry of firms into an industry.

a ors a ro r s ro r a s ry ar all **barriers to entry**. r o o oly, s ro arr rs o ry ly lo all o al o - o . o a a r arr rs ay r ol o oly, a ar s r r o - a y a r s. ll a r arr rs ay r ry o a a rly lar r o o r s, r s o o o ol s o o . a s o a y ry arr rs r s ry o a ry lar r o r s, ro as s o r o o . o, arr rs o ry ar r o o ly o r as o r o o oly also o o r ar s r r s r s so r o o o oly-l o o s a a o r.

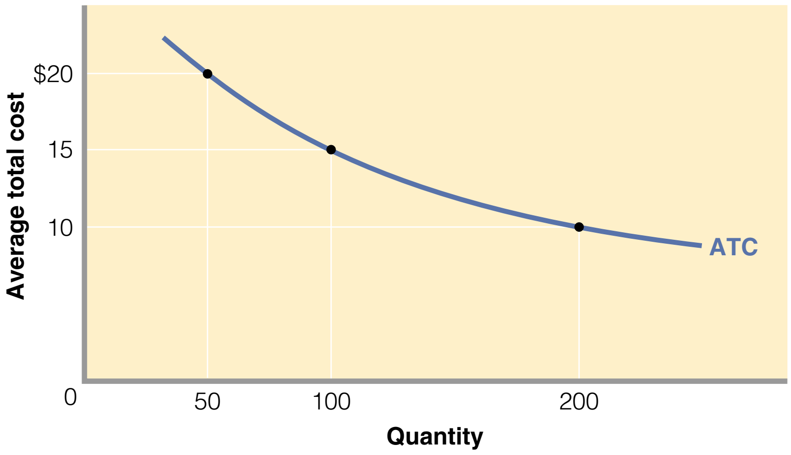
Economies of Scale

o r olo y so s r s s s a o o s o s al l a ra o al os a r s ar s . o, a r ’s lo -r a ra - os s l ll l o r a ra o o . G ar a , o ly a lar r s, or r , o ly a s l lar r , a a lo a r- a o al os s.

r 10-1 a s o o s o s al o r a ra o o s. o al o - s r a s a o ra , o ly a s l ro r a sa s y a a l as os . o , or a l , a a o o ol s a ro 200 s a a r- os o $10 a a o al os o $2000. r ar o r s s ry a a ro s 100 s, os s $1 a o al os r s s o $ 000 (200 s × $1). s ll or o s a o o r r s a ro 0 s o l oos a o al os o $20 a $ 000, r s ly. o l s o lo -r s l , o ly a s l ro r, a o o ol s , a ro a y ar lar o a o al os .

a r o o oly s s s a s ry, o o s o s al ll s r as a ry arr r a ll ro o o ol s ro o o . r s a ry o r s ry as s all-s al ro rs a o r al os o o s o

FIGURE 10-1



A declining long-run average-total-cost curve over a wide range of output quantities indicates extensive economies of scale. A single monopoly firm can produce, say, 200 units of output at lower cost ($10 each) than could two or more firms that had a combined output of 200 units.

o o ols a r or a o o a or al ro s ssary or s r al or ro . r ry o s ar o , a s, o r s ry as a lar -s al ro r so as o a ssary o o s o s al , as-s la a l s r r o l ss a a o s o a , a a r r r s o l l o s r . os as s a -al o s a l s a r s s o s ar ar ro , la s y or s o r s s r s as a o o l s, o r o ra so ar , o r al a r-ra , a as s l ar rar ly s ss l.

r r s a , ar a r s lo -r r r a ra o al os s ar s ll l , s l r s all a *na al mono ol* . s a a a ral o o ol s ’s lo r os o l a l o ar a lo r r a s ry r or o . a o ’ ssar ly a . r o o ol s ay, s a , s s r ar a o a o a s s a al o o ro . a , lo s - - os a a a o a a ral o o ol s o l a r o o o ol s as ro a o as lo r r s o o s rs, s y o r r la s so a ral o o ol s, s y r y ay ar . ll say or a o a la r.

Legal Barriers to Entry: Patents and Licences

Go r also r a s l al arr rs o ry y a ar a s a l s.

PATENTS

<www.aamc.org/newsroom/reporter/feb2000/gene.htm> Does the gene patenting stampede threaten science?

a en s l s r o a or o s , or o allo a o r o s , r or s o . a s a a la s a o ro or ro r als o o l s o o a s ar or a s o l-o . s a , a s ro or a o o oly os o or l o a . orl ’s a o s a a r o a or a l o 1 y ars ro o a l a o . a s a r ro ly ro o o r - ay a s s as , roso , o a , ro , olaro , G ral l r , a or l.

s ar a lo (&) s a l a s o os a a l o s a ro s. r s a a o o oly o r ro r o r s ar or y r as a s o o rs a s a s o s r r ar os o . ro ro o a a a r s ar r r o lo a a l ro s. ar a al s ry, a s o r s r o r s a ro lar o o oly ro s a a l a s o ry o a a l s. o, o o oly o r a ro a s ay ll s l -s s a , o a s ally r a r r s o or al ra .

LICENCES

Go r ay also l ry o a s ry or o a o ro *licen ing*. a o all l, a a a a o- l s o l o a o s o s-s o l s s o ly so a y ra o a l s o s a o s a o ra ar a. a y lar s o o a l r o all s s r r o r a a a . o s r s r o o s ly o a s r a s o o ro or a o rs a r rs. a s a o r s ry o or r s a ro lo r. a s a s o r l s s l o ro so ro a r y r a a l o o oly. or a l , so ro s, o ly ro -o r a l o l s a s ll l or. larly, a y ro s a l s s l s o r lo r s.

Ownership or Control of Essential Resources

o o ols a s r a ro r y as a o s a l o o al r als. or a - l , a r a o s or o rols a r so r ss al o ro o ro ss a ro ry o r al r s. o r a o al l o a y o a a a (o all o) o roll 0 r o orl ’s o l r s r s. al sa a ra l r ay o all ar y os s o sa a ra l. , s ry l or s or s l a s o r a a s s ro ss o al s or s l a s a o ra s s lay rs a a lo - r l as s o a or s a s a ar as.

Pricing and Other Strategic Barriers to Entry

a r s o ro ro ry y, say, s o o s o s al or o - rs o ss al r so r s, ry ay ly lo y ay o o - ol s r s o s o a s y r als o r s ry. o ro a ra , o o ol s ay r a a ry arr r y slas s r , s s a r s , or a o r s ra a o o a l or ra o s . 2000 a r a ral o r r l a roso a a ll - al a o s o a o r s a ro r ro s r ar . roso lo s o ro s r, r lor r, a a a ay r . also ro r s o s o s o s o ra sys o o r a a r rs a a r roso ’s r lor r ra r a s a ’s a a or.

MONOPOLY DEMAND

o a a la so r s o o o oly, a o l a o l o r o o oly so a a a aly s r a o s o s. ’s s ar y a r ass o s

1. a s, o o s o s al , or r so r o rs s r o r o o ol s ’s s a s.

2. o o o r r la s r .

. r s a s l - r o o ol s ar s sa r or all s o o .

r al r a r o o ol s a a r ly o s ll r l s o a s o ar . r ly o s ll r a s a r ly las a a r r y ar s ly a a . s a r - a r a a s ll as or as l l as a s a o ar r . a a o al sol ll a a o o o s a ro r o r ’s o al r , a s a ar al r or o s ll r s o - s a a al o ro r . (r o a l -2 a r -1 or r , ar- al-r , a o al-r r la o s s or r ly o r .) a r or o o ol s (a or a y r ly o s ll r) s ry r ro a o r o or. a s r o o - ol s *i* s ry, s a r s *he ma ke demand c e.* a s ar- a s o r ly las , o o ol s ’s a r s o slo .

ol s 1 a 2 a l 10-1 ll s ra s o . o a a y a r as s as r r as s.

a r r s ara a r s or r ly o s-ry a or a s l r s a s ry, o ly a s l a r s r o o oly. r a s ry ar o a sa . a ra ar o a a a a l 10-1 as a r *D* r 10-2. s s o o ol s 's a r *and* ar a r . o ar -slo a r as r l a o s a ar ss al o r-s a o o oly o l.

One: Marginal Revenue Is Less than Price

o o ol s 's o ar -slo a r a s a a r as sal s o ly y ar a lo r r . o s ly ar al r s l ss a r (a ra r) or ry l l o o rs . y r aso s a lo r r a l s o o ly o ra o sol also o all r or s o o . o o ol s o l a sol s r or s a a r r ra o a o ro a sol . a a o al o o sol r as s o al r y a a o al o s o r l ss s o r s a a ly o all r or s o o .

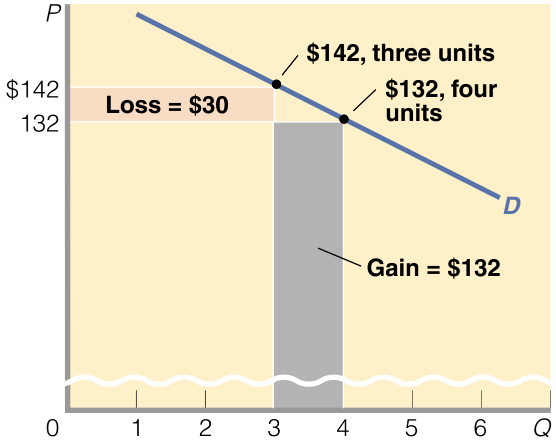
r 10-2 o r s s o . a l o r a y o - a o s ro o o ol s 's a r . o o ol s a s llo or a $1 2 a a a $1 2 a a ay o a $1 2 o ra r . o s ll a o r or $1 2, o o ol s s also s ll rs r s a $1 2 ra r a $1 2. s $10 r o r o r s r s l s a $ 0 r loss. r o al r ro s ll a o r s $102 $1 2 a s $ 0 loss. s a o $102 ar al r o o r s o o sly l ss a $1 2 r o o r .

TABLE 10-1 REVENUE AND COST DATA OF A PURE MONOPOLIST

REVENUE DATA				COST DATA			
(1) Quantity of output	**(2) Price (average revenue)**	**(3) Total revenue (1) × (2)**	**(4) Marginal revenue**	**(5) Average total cost**	**(6) Total cost (1) × (5)**	**(7) Marginal cost**	**(8) Profit (+) or loss (–)**
0	$172	$ 0			$ 100		$–100
1	162	162	$162	$190.00	190	$ 90	– 28
2	152	304	142	135.00	270	80	+ 34
3	142	426	122	113.33	340	70	+ 86
4	132	528	102	100.00	400	60	+128
5	***122***	***610***	***82***	***94.00***	***470***	***70***	***+140***
6	112	672	62	91.67	550	80	+122
7	102	714	42	91.43	640	90	+ 74
8	92	736	22	93.75	750	110	– 14
9	82	738	2	97.78	880	130	–142
10	72	720	–18	103.00	1030	150	–310

FIGURE 10-2 PRICE AND MARGINAL REVENUE IN PURE MONOPOLY

A pure monopolist, or any other imperfect competitor with a downsloping demand curve such as *D*, must set a lower price to sell more output. Here, by charging $132 rather than $142, the monopolist sells an extra unit (the fourth unit) and gains $132 from that sale. But from this gain must be subtracted $30, which reflects the $10 less the monopolist charged for each of the first 3 units. Thus, the marginal revenue of the fourth unit is $102 (= $132 – $30), considerably less than its $132 price.



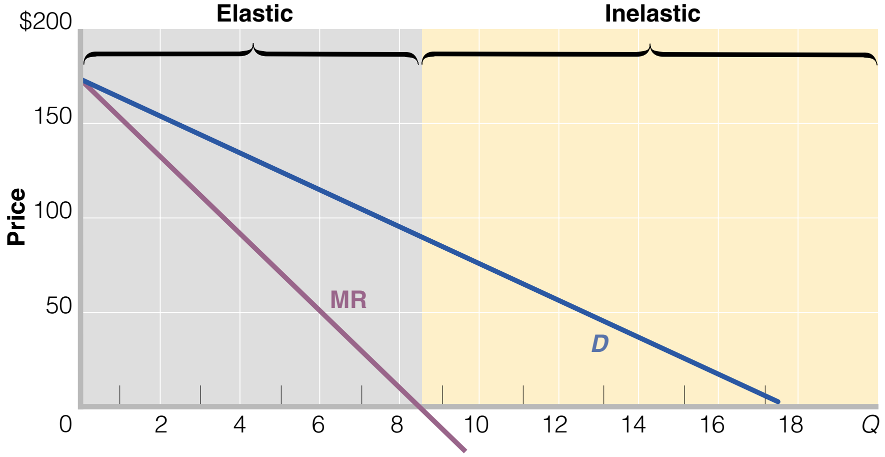
ol a l 10-1 s o s a ar al r s al ays l ss a or-
r s o ro r ol 2, or rs o o . a s
ar al r s a o al r asso a a *addi ional*
o o , l a o s o ar al r ol a a o al
r r as s a a s ra (as s o ol).
s o r la o s o o ol s ʼs ar al-r r a
o al-r r r 10- . or s r , a a r -
a a o ol s 1 ro a l 10-1, ass a s ss $10 r
s a l o a o al o sal s. a s, o o ol s a s ll 11 s
a $ 2, 12 s a $ 2, a so o .
o a o o ol s ʼs r l s lo a r , a
a ar al r s l ss a r a ry o a y ry rs
. s r also s al r la o s o al r a ar al r -
. a s ar al r s a o al r , ar al r s
os l o al r s r as . o al r r a s s a ,
ar al r s ro. o al r s s , ar al r s
a .

Two: The Monopolist Is a Price-Maker

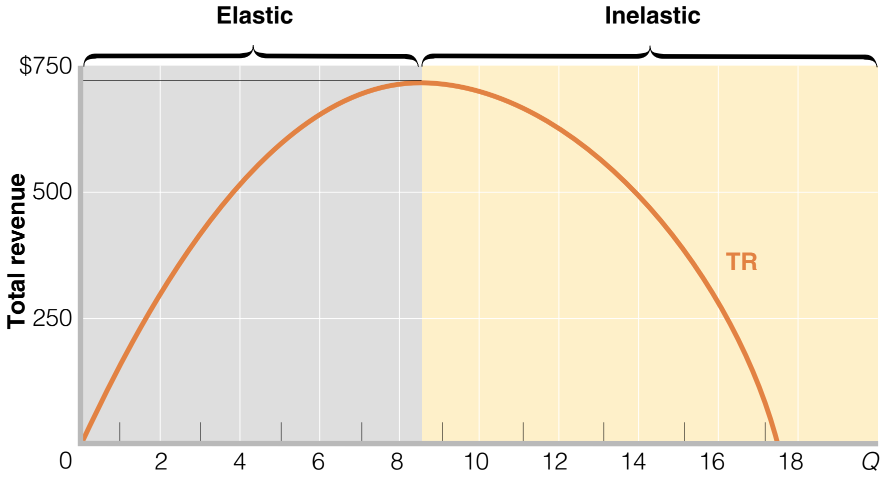
ll r o ors, r r o o oly, ol o oly, or o o ol s o -
o , a o ar -slo a r s. o, r s os s r s a
o o r or a o r o al s ly ro r o o s o s.
a ar s ly, y a also ro r . r s o -
ar -slo a r s ar *ice-make* .
s a s os r o o oly, r o r o rols o al o .
o o ol s a s a o slo a r a o s asso -
a so r . s, a ol o o o ro ,
o o ol s s also r ly r r ll ar . ro o -
rol o o , a a r . ro ol s 1 a 2 a l 10-1 a
o o ol s a ar a r o $ 2 ro s a o rs or sal 10 s, a
r o $ 2 ro s a o rs or sal s, a so or .

FIGURE 10-3 DEMAND, MARGINAL REVENUE, AND TOTAL REVENUE FOR AN IMPERFECTLY COMPETITIVE FIRM

Panel (a): Because an imperfectly competitive firm must lower its price on all units sold in order to increase its sales, the marginal-revenue curve (MR) lies below its downsloping demand curve (*D*). The elastic and inelastic regions of demand are highlighted. Panel (b): Total revenue (TR) increases at a decreasing rate, reaches maximum, and then declines. Note that in the elastic region, TR is increasing and hence MR is positive. When TR reaches its maximum, MR is zero. In the inelastic region of demand, TR is declining, so MR is negative.



(a) Demand and marginal-revenue curves



(b) Total-revenue curve

Three: The Monopolist Sets Prices in the Elastic Region of Demand

o al-r s or r las y o a s as s or o r r l- a o . all ro a r a o al-r s r als a a s las , a l r ll r as o al r . larly, a s las , a l r ll *ed ce* o al r . a o o a r *D* r 10- (a), o s r a as r l s ro $1 2 o a ro - a ly $ 2, o al r r as s (a ar al r , r or , s os), a s a a s las s r ra . o rs ly, or r l s lo $ 2, o al r r as s (ar al r s a), a s a a s las r .

l a o s a a o o ols ll r oos a r a y o - a o r r o s a s o al r o r as (ar al r o a). ro - a o o ols ll al ays a o a o las s o s a r a o ro so r a y o a o las r o . r 's y o o las r o , o o ols s lo r r a r as o . las r o a lo r r a s l ss o al r . r as o al ays a s r as o al os . ss o al r a r o al os y l lo r ro . (*Key Question 4*)

QUICK REVIEW

- A pure monopolist is the sole supplier of a product or service for which there are no close substitutes.
- A monopoly survives because of entry barriers such as economies of scale, patents and licences, the ownership of essential resources, and strategic actions to exclude rivals.
- The monopolist's demand curve is downsloping, and its marginal-revenue curve lies below its demand curve.
- The downsloping demand curve means that the monopolist is a price-maker.
- The monopolist will operate in the elastic region of demand since it can increase total revenue and reduce total cost by reducing output.

OUTPUT AND PRICE DETERMINATION

a s r a y o a o lla ro - a o o ols oos o o ra o a s r s s o , s a ro o os s o o r a alys s.

<hadm.sph.sc.edu/Courses/Econ/Monopoly/Mon.html> Economics interactive tutorial: Monopoly price and output

Cost Data

os s , ll ass a , al o r s a o o ols ro - ar , r s r so r s o ly a loys sa olo y as a r 's o r . s ass o l s s s os a a l- o a r a a l a r , so a o ar r o s o s o a r o o oly os o a r o or. ol s ro a l 10-1 r ro r os a a ro a l -2.

MR = MC Rule

o o ols s o a o al ro ll loy sa ra o al as a ro -s r a o s ry. ll ro a o r o o as lo as a a s or o o al r a a s o o al os . r ll r as o o o a ar al r als ar al os ( ).

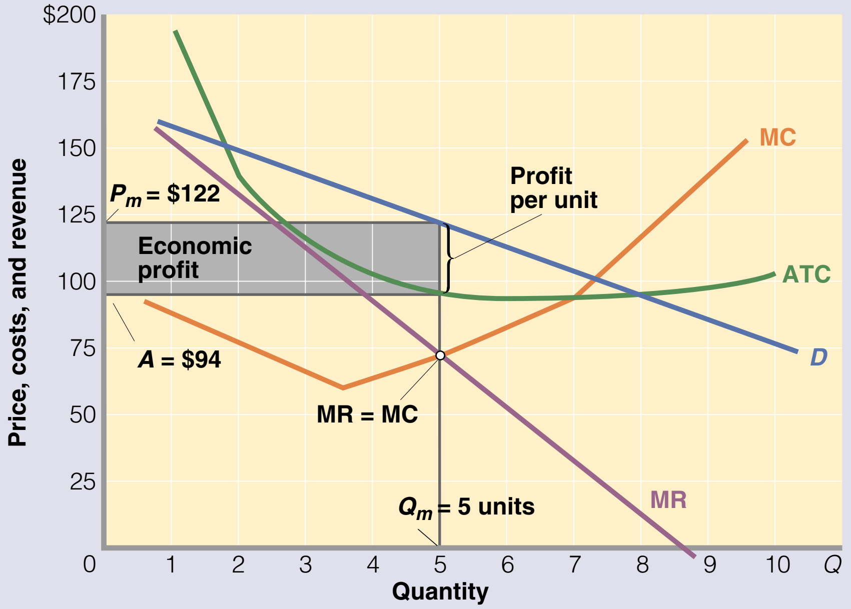
o ar so o ol s a a l 10-1 a s a ro - a - o s s, a s s las o o os ar al r s s ar al os . a r ll o o ol s ar a s l s o as ol s 1 a 2 a l 10-1 a s r s o ly o r a s a sol $122.

s a alys s s s o **igure 10-4 (ey Graph)**, r a ra a , ar al-r , a ra - o al- os , a ar al- os a a o a l 10-1.

Key Graph

FIGURE 10-4 THE PROFIT-MAXIMIZING POSITION OF A PURE MONOPOLIST

The pure monopolist maximizes profit by producing the MR = MC output, here Q_m = 5 units. Then, as seen from the demand curve, it will charge price P_m = \$122. Average total cost will be A = \$94, meaning that per-unit profit is $P_m - A$ and total profit is $5 \times (P_m - A)$. Total economic profit is thus represented by the grey rectangle.



QUICK QUIZ

1. The MR curve lies below the demand curve in this figure because the

a. the demand curve is linear (a straight line).
b. the demand curve is highly inelastic throughout its full length.
c. the demand curve is highly elastic throughout its full length.
d. the gain in revenue from an extra unit of output is less than the price charged for that unit of output.

2. The area labelled "Economic profit" can be found by multiplying the difference between *P* and ATC by quantity. It also can be found by

a. dividing profit per unit by quantity.
b. subtracting total cost from total revenue.
c. multiplying the coefficient of demand elasticity by quantity.
d. multiplying the difference between *P* and MC by quantity.

3. This pure monopolist

a. charges the highest price it can get.
b. earns only a normal profit in the long run.
c. restricts output to create an insurmountable entry barrier.
d. restricts output to increase its price and total economic profit.

4. At this monopolist's profit-maximizing output

a. price equals marginal revenue.
b. price equals marginal cost.
c. price exceeds marginal cost.
d. profit per unit is maximized.

Answers

1. d; 2. b; 3. d; 4. c

ro - a o o rs a s o o (Q_m) r ar-
al-r ( ) a ar al- os ( ) r s rs ( ).
o r o o ol s ll ar , a r al l ro Q_m
o a r *D*. r P_m a Q_m s a sol s $122,
s s as ro - a r . o o ol s s s a y
a Q_m o ar s ro - a r o $122.

ol s 2 a a l 10-1 s a , a s o o , ro
r ($122) s a ra o al os ($). o o ol s s ar s a o-
o ro o $2 r a o al o o ro s $1 0 (s ×
$2). r 10- , r- ro s P_m *A* r *A* s a ra o al os o ro-
Q_m s. o al o o ro y l ly s r- ro y
ro - a o Q_m.

o r ay a r ro - a o s y o ar
o al r a o al os a a oss l l l o ro o a oos
o r a s os r . s ol s a a l 10-1 o
r y o r o l s o a s s ro - a o . a ra
ra o o al r a o al os a a s o o l also s o r a -
s r (a ro) a s o o . a l 10-2 s a s - y-
s s ary o ro ss or r ro - a o ,
ro - a r , a o o ro r o o oly. (***Key Question* 5**)

No Monopoly Supply Curve

all a als *P* r o o a a s ly r o a r ly
o r s r y a ly (*P*) ro - a
r l . a y s ar - r r , r ly o s ll r ll
a ro y s ly a y a s al o a r .
ar r r as s or r as s, o r ro s or or l ss
o . a ar r s s asso a a s o , a all
r o a rs o r s ly r . s s ly r r s o o
or o o r 's r a l s a o a ra - ar a l - os r
(s r -).

TABLE 10-2 STEPS FOR GRAPHICALLY DETERMINING THE PROFIT-MAXIMIZING OUTPUT, THE PROFIT-MAXIMIZING PRICE, AND ECONOMIC PROFIT (IF ANY) IN PURE MONOPOLY

Step 1. Determine the profit-maximizing output by finding where MR = MC.

Step 2. Determine the profit-maximizing price by extending a vertical line upward from the output determined in step 1 to the pure monopolist's demand curve.

Step 3. Determine the pure monopolist's economic profit using one of two methods.

Method 1. Find profit per unit by subtracting the average total cost of the profit-maximizing output from the profit-maximizing price. Then multiply the difference by the profit-maximizing output to determine economic profit (if any).

Method 2. Find total cost by multiplying the average total cost of the profit-maximizing output by that output. Find total revenue by multiplying the profit-maximizing output by the profit-maximizing price. Then subtract total cost from total revenue to determine economic profit (if any).

rs la o l s s a r o o ol s 's ar al- os r o l also s s ly r , a s *no* as . *The e mono oli ha no - l c e* r s o r la o s r a a y s l or a o o ol s . o r , o o ol s a s ar al r a ar al os o r o , or o o ol s ar al r s l ss a r . a s o o ol s o s o a ar al os o r , s oss l or r a o o s o r a o r r s or sa o . o o yo rs l o s, r r o r 10- a l a , s r ar al-r r a rs s ar al- os r a sa o as o s r s ar al-r r . ra a a r a ro ly orr s o s yo r ar al-r r . r s, sa o o s o orr s o s a r ro - a r . o l s o r s os l , r asso a a o l l Q_m, a so r s o s ly r or r o o ol s .

Misconceptions Concerning Monopoly Pricing

r a alys s os s o alla s o r o o oly a o r.

NOT THE HIGHEST PRICE

a s a o o ol s a a la o a r , o l o l ll ar s r a . a s orr . r ar a y r s a o P_m r 10- , o o ol s s s a s y y l a s all r- a - a o al ro . o o ol s s s a o al ro , o a r . o r s a o l ar o l r sal s a o al r oo s r ly o o s a y r as o al os .

TOTAL, NOT UNIT, PROFIT

o o ol s s s a *o al* ro , o a *ni* ro . r 10- a ar l o ar so o r al s a a ra o al os a r a ar o s oss l o s a s a r- ro s r a r a a o sl ly o l o ro - a o Q_m, as s a l 10-1, r ro a o r so o s $ 2 ($1 2 $100) o ar $2 ($122 $) a ro - a o o s. r o o ol s a s a lo r- a - a r- ro a s a o al sal s or a o - sa or lo r ro . ro -s o o ol s o l ra r s ll s a a ro o $2 r (or a o al ro o $1 0) a o r s a a ro o $ 2 r (or a o al ro o o ly $12).

Possibility of Losses by Monopolist

l l oo o o o ro s r a r or a r o o ol s a or a r o or. lo r r o or s s o a o ly a or al ro , r as arr rs o ry a a a y o o ro r al y o o ol s a rs s . r o o oly r ar o ra s o r as s ly, r o r , a l a o o ro .

r o o oly o s o ara ro . o o ol s s o o a s as s a r a or s ro . or s o ar -s os r s a s y s ala r so r r s. a a os s a o a y o o ol s s ar l ss a o ra l a a r 10- , o o ol s ll r loss s s or r . s s o a ar , o o oly r r s r 10- s rs a loss, as s o , a s o a a a r la ly os s. o s o o ra or a s s o al loss s l ss a s os . or r s ly, a o Q_m o o ol s 's r P_m s s a ra ar a l os V. s loss r s A P_m, a o al loss s s o y r a l . r o or, o o ol s ll o rs s o ra a a loss. a o loss s, lo r r 's o rs ll o r r so r s o al r a s r s a o r r ro o or s. s, a o o ol s or al a or al ro or r lo r .

ECONOMIC EFFECTS OF MONOPOLY

's o al a r o o oly ro s a o o so y as a ol . r r r or s al a o ll o o o lo -r y a r ly o ar , y r l al y P .

Price, Output, and Efficiency

r 10- ra ally o ras s r , o , a y o o s o r o o oly a a r ly o *ind* . ar r 10- (a), ar r a r ly o s ry's ar s ly r S s or- o al s o ar al- os r s o all r s s ry. 's s os r ar 1000 s r s. o ar r o s ly r s S ar a D, r ly o r a o o P_c a Q_c. all a s r o o a o r s l s o ro y a allo a y. *P od c i e ef cienc* s a a s r ry a or s r s o o ra r a ra o al os s a a . s o - o s o 1000 r o ors s s ry o r , Q_c. ro r s a lo s l l o s s a ra o al os . *alloca i e ef cienc* o r o o r s l s a s ro o o rs o a o a r (as r o a ro 's al or ar al o

FIGURE 10-5

If demand D is weak and costs are high, the pure monopolist may be unable to make a profit. Because P_m exceeds V, the average variable cost at the MR = MC output Q_m, the monopolist will minimize losses in the short run by producing at that output. The loss per unit is $A - P_m$, and the total loss is indicated by the pink rectangle.

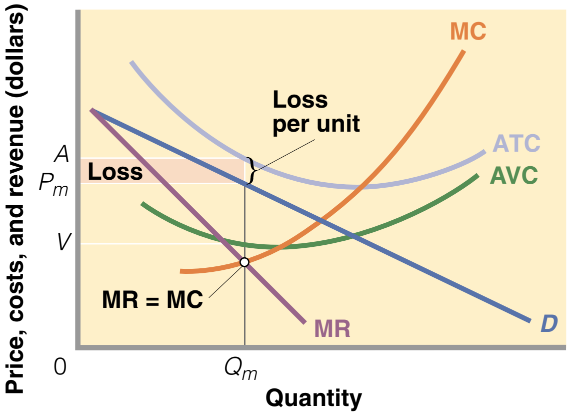
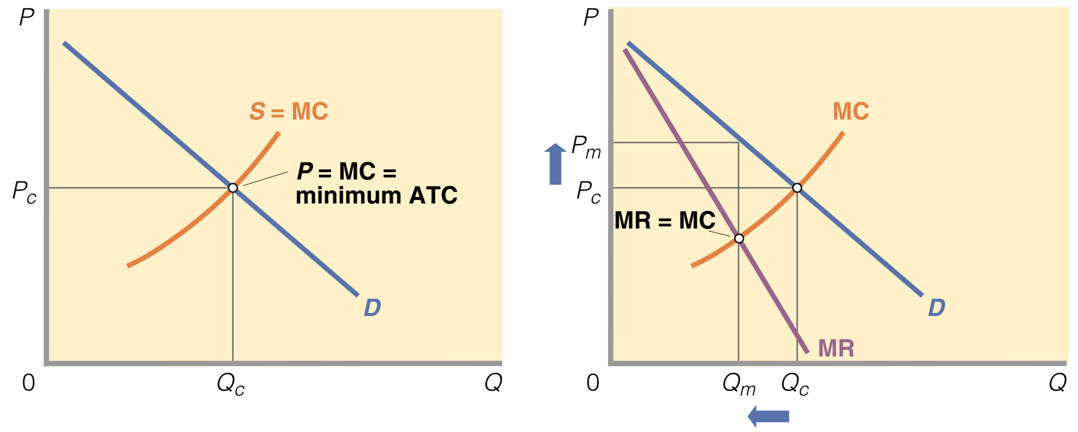


FIGURE 10-6 INEFFICIENCY OF PURE MONOPOLY RELATIVE TO A PURELY COMPETITIVE INDUSTRY



(a) Purely competitive industry **(b) Pure monopoly**

Panel (a): In a purely competitive industry, entry and exit of firms ensures that price (P_c) equals marginal cost (MC) and that the minimum average-total-cost output (Q_c) is produced. Both productive efficiency (P = minimum ATC) and allocative efficiency (P = MC) are obtained. Panel (b): In pure monopoly, the MR curve lies below the demand curve. The monopolist maximizes profit at output Q_m, where MR = MC, and charges price P_m. Thus, output is lower (Q_m rather than Q_c) and price is higher (P_m rather than P_c) than they would be in a purely competitive industry. Monopoly is inefficient, since output is less than that required for achieving minimum ATC (here at Q_c) and because the monopolist's price exceeds MC.

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so y) als ar al os (or o al r a ro s or o y so -
y ro a y o o y). s or *P* .
o l 's s os a s s ry o s a r o o oly r 10- ( )
as a r s l o o r y o all s o ors. also ass a o
a s os s or ar a r s l ro s ra a a s-
ry s r r . a r or rly 1000 o r s ar o a s l r
o o ol s o s s o 1000 o o ra s.
o ar s ly r *S* as o ar al- os r ( )
o o o ol s , s a o o r s o s a y ra la s.
(o o ol s o s o a a s ly r , as s , a r o
S la l.) or a a , o r, s o a s . ro o
o a o 1000 al o r s, a as r ly las , a
ar al r as r or al o r . a r a (r) a
a ro s. ar a a al a ar sa
o r o o ol s . r *i* s ry, a s o o ol s s s
o slo a r *D* s o r 10- ( ).
s a s a ar al r s l ss a r , a a ra ally
r l s lo a r *D*. s r l , o o ol s
s l s o *Q_m* a r *P_m*. o ar so o o ra s r 10- r als
a o o ol s s ro a l o s ll a s all r o a a r r a
o o ro rs. o o oly y l s r ro or allo a
y. o o ol s 's o s l ss a *Q_c*, o a a ra o al
os s lo s . r s r a o r *P_c*, lo -r -
l r a s r o o als a ra o al os . s,

o o oly r *e ceed* a ra o al os . lso, a o o ol s 's Q_m o , ro r s o s ra ly r a ar al os , a s a so y al s a o al s o s o o ol ro or ly a al- s al r a ro s r so r s o l o r s ro . o o o- ol s 's ro - a o r s l s a rallo a o o r so r s. o o ol s s ro a l o r s r o a r or loy r r so r s a s s ro so y's s a o . o o o ol s o s o a allo a y.

o o oly, , *P* a *P* .

Income Transfer

ral, o o oly ra s rs o ro o s rs o s o ol rs o o o o oly. y r o r ar o r, o o ol s s ar a r r a o l a r ly o r sa os s. o, o o ol s s l y a r a a o o s rs a o a s s a al o o ro s. s o o ol s ro s ar o ally s r , a s r o ro s lar ly o or ora s o . o rs o o o ol s r r s s s o r a s o r s o o s rs o o r ay or ro . a s , o a ra , s o rs a or o a y rs, o o oly r as s o al y.

Cost Complications

r al a o o r o o oly as l s o o l a , al os s, a r ly o o ol s s ry ll ar a r r , ro a s all r o , a allo a o o r so r s l ss ly a a r ly o s ry. s r or r s l s or a ry arr rs ara r o o oly. o s r o a os s ay o sa or r ly o a o o ol s ro rs. os rr y a o o ol s ay r lar r or s all r a a rr y a r ly o r . r ar o r r a- so s y os s ay r (1) o o s o s al , (2) a a or all *X-inef cienc* , ( ) or o o oly- r s r r s, a ( ) ry lo -r r- s , allo s or olo al a a .

ECONOMIES OF SCALE ONCE AGAIN

r r ar s o o s o s al , ar a ay o s os or a lar ro o r s, a ro a s al . s as s, a s ry o o or o r s o l a a lo r a ra o al os a o l sa s ry a o ro s o r s. r , o ly a s l r a a ral o o oly a l o a lo s lo -r a ra o al os .

o r s r la o or a o olo s, or a l , o r so - ar , r s r , a r l ss o a o s, a s lay s o o s o s al . s s r s a ro , r lo -r a ra o al os s a l . Gr a r s o s al s, s r a o ro lo - os s, a l ar y o all a ro o o s o s al . lso, *im l- aneo con m ion a ne o k effec* a r os s.

SIMUL-TANEOUS CONSUMPTION A product's ability to satisfy a large number of consumers at the same time.

ro 's a l y o sa s y a lar r o o s rs a sa s all **simultaneous consumption** (or *non i al o con m ion*). ll o rs s o ro a rso al o r or a s o r, roso s o

ro s o s ro ra o ly o . , a ry lo ar al os , roso
l rs s ro ra y s o ll o s o o s rs. sa s r or r
s r ro rs, s ro rs, a r l ss o a o r s. a s
ar al os s ar so lo , a ra o al os o o l s as or s-
o rs ar a .

NETWORK EFFECTS
Increases in the value of a product to each user, including existing ones, as the total number of users rises.

etwork effects ar r as s al o a ro o a s r, l s-
s rs, as o al r o s rs r s s. o r so ar , ll o s, a rs,
al o rs, a o r ro s r la o r ar oo a l s.
o rs a r s r a s o a ss , yo a o ly s - a l
ssa s o . y a s lar so ar , o s, s r a s s, a
o os a a a o - a l ssa . s o ro o a r-
so ar a lar r r o o l o o sys .

or s ay r a ar o ar o o oly a s o s rs
o oos s a ar ro s a ry o ls s s . o s a
or s ro s r s r ro rs o ro ra ly a s a
o o s o s al . all r r s, a r- os r ro s or
ro ro s a r or o o o s ss.

o o s s rally a r a so or a o r s a o y
a s r o o s o s al , , os o o s s s o r s
r s ar r ly a ral o o ol s. os r s ally a r
s al a l ss a ll s o ar , a , a ral o o oly
lo s, 's l ly a o o ol s ll ass os r o s alo o o -
s rs as r r o s. o, r a s a a l o o s, o o s o
s al o o a ral o l s o a o o ol sy l l ss y a
or o s r s.

X-INEFFICIENCY

o s r all a ra - o al- os r s s s oo , a ass
a r s s os olo y. o r or s, s s ol-
o y a r s o a lo s a ra o al os o a r l l o o -
oos s o ro . **-inefficiency** o rs a r 's a al os o
ro a y o s r a r a lo s oss l os o ro . -
r 10- - y s r r s y o ra o a o s a ' a o
lo s - os r . s o s, r- os s ar (as o os o $_1$)
or o Q_1 a ' (as o os o $_2$) or o Q_2. y o a o
a ra - o al- os r r 10- s oss l r s y or a
a a y r .

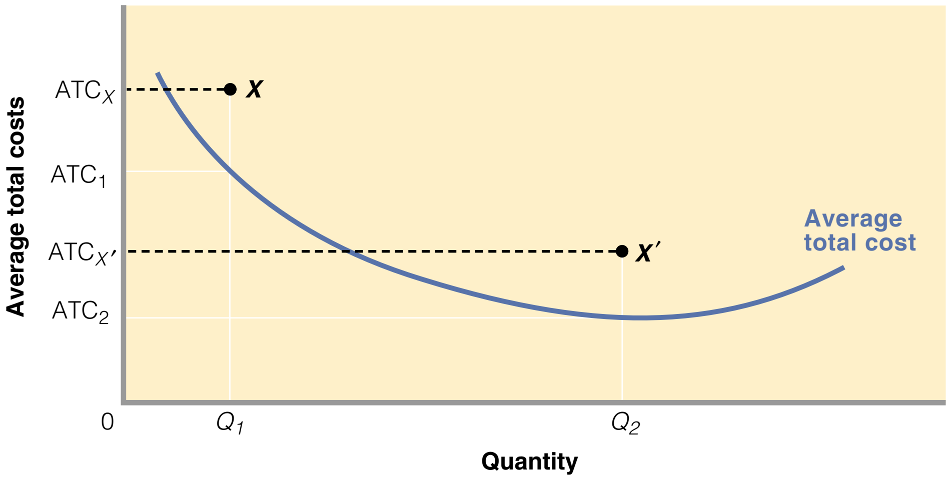
y s - y allo o o r r s ro s a s r s a
a a rs ay a oals s as or ora ro , a as r or l , a o a
o s ss r s , or o s o o r la s a o os -
a o . r - y ay ar s a s a r 's or rs ar oorly o -
a or ly s r s . r a r ay s ly o l ar a r ,
r ly o r l s o s o a as o os o r l a al la o s o
os s a r s.

X-INEFFICIENCY
Failure to produce any specific output at the lowest average (and total) cost possible.

or o r r os s r l a s o s r o o ol s r s or
o ar - y a o ro rs o. r s a y
o. r s o s r s ar o ally r r ss r ro r als, or -
o r ally o s r . o o ol s s ar s l r ro
s o or s y ry arr rs, a a la o r ss r ay l a o
- y.

<www.maths.tcd.ie/pub/econrev/ser/html/morton.html> Monopoly and x-efficiency

FIGURE 10-7 X-INEFFICIENCY



The average-total-cost curve (ATC) is assumed to reflect the minimum cost of producing each particular unit of output. Any point above this lowest-cost ATC curve, such as X or X′, implies X-inefficiency: operation at greater than lowest cost for a particular level of output.

r s o s a l o - y, a a s s s a r as s as o o r as s. r aso a l s a s a - y ay 10 r or or o os s or o o ol s s o ly r or a a ra ol o ol s s ry o r lar s r s ro 0 r o o al o .[1] or s o o a or y s ra ary, o s sa r o . - y s s, a s or a o r o - r ss r s ar s ro a r s oy s la ar os o s.[2]

RENT-SEEKING EXPENDITURES

RENT-SEEKING BEHAVIOUR The actions by persons, firms, or unions to gain special benefits from government at taxpayers' or someone else's expense.

Rent-seeking behaviour s a a o ra s r o or al o a ar lar r or r so r s l r a so o ls ’s, or so y’s, s . a s a a o o ol s a o a a o o ro lo r . r or , s o s r r s a a r ay o o r a s o a r or a a a o o - oly ra y o r ro l sla o or a l s l . r - s r s a o o r ’s o , y l arly r as s os s. y ly a o o oly ol s r os s a l ss y a s - s r 10- ( ).

TECHNOLOGICAL ADVANCE

ry lo r , r s a r r os s ro s o ry a l - a o o olo y. o o ol s s ar or l ly a o ro- rs o lo or ro o s o r , y o o o oly o rs a . r s ar a lo (&) s o o a r 12, ll ro o ly a r ass ss r .

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[1] William G. Shepherd, *The Economics of Industrial Organization*, 4th ed. (Englewood Cliffs, NJ: Prentice-Hall, 1997), p. 107.

[2] F. M. Scherer and David Ross, *Industrial Market Structure and Economic Performance*, 3rd ed. (Chicago: Rand McNally College Publishing, 1990), p. 672.

ral o o o sss a a r o o ols ll o olo - ally ro r ss . l o s o o ro ro s a l a s o a & , as l l o l s (or ro s). a s o o ors a s a o r al r ss r s s or olo al a a a o o ol ar . a s o ss l r ar os o , r o o o- l s a a or o a l ar r s ly s o al y or so. a a s ar a olo al a a ay o o o o ol s 's arr rs o ry. s, o o ol s ay o o s olo al a a o a o all r y o r als. s as olo al a a s ss al o a a o o o oly, s o al o o , o o o oly ar s r r , a s r olo al a a . y ass o , o s o o s s r o o oly o l ry s o l ly lo .

Assessment and Policy Options

o o oly s a l a o r o a o o y. o o ol s s a ar r- a - o r s a r s l a rallo a o o r so r s o o o- ol ro . o o ol s s a s o a o , a r -s a o r, a os r - y. r os s ar lo a s o o o so s al , o o ol s s a o ara a r y ar ll r os lo os s. os sa s ay s ly a r o o o oly as r a r o o ro . or a ly, o r, o o oly s o s r a o o y. arr rs o ry ar s l o o l ly s ss l. l o r s ar a olo al a a ay s r ar os o o a o o oly, olo y ay also r o o oly o r. r , r a o o olo s ay or o s roy o o oly os o s. or a l , lo o o r r l ry, a a s, a - a l as ro o o oly o r o a a a os or ora o . a l l s o o o ol s ar o all y sa ll a y - olo s a r ra s ss o o a o a s al s als o r r . larly, a s ally r a or y o, lo o a s s s a l ro s o r s s a a a - a s. so r s o o o ol r so r s so s ar o , a o - o ro or r s ay r . ally, a o o oly s s ly ar l o r o o ro ro s, ay s r s r la ly lo o s- o ra r als ro lo s ro s. so, o s rs ay ay arly o r s o r s o o s la . o a s o l o r o a o o o oly ar s s r al orl o o s s a r a o r s o loo ar lly a o o oly o a as - y- as as s. r ral ol y o o s ar a a la l

1. o o oly s a a s s a ro a o a o s, r a s s s a al o o y, a a ars o lo las , o r a l ar s a a s o o oly r a a a'a a - o s la s. o l y o o o oly a s , r a r r ssly ro ro a r a s ss a s or ro o o or or o r s.

2. o o oly s a a ral o o oly, so y a allo o o a - . o o o r s ro ro s, o r ay o r la s r s a o ra o s.

. o o oly a ars o s s a a l o r a lo r o , say, a s o r olo y, so y a s ly oos o or .

QUICK REVIEW

- The monopolist maximizes profit (or minimizes loss) at the output where MR = MC and charges the price that corresponds to that output on its demand curve.
- The monopolist has no supply curve, since any of several prices can be associated with a specific quantity of output supplied.
- Assuming identical costs, a monopolist will be less efficient than a purely competitive industry because the monopolist produces less output and charges a higher price.
- The inefficiencies of monopoly may be offset or lessened by economies of scale and, less likely, by technological progress, but may be intensified by the presence of X-inefficiency and rent-seeking expenditures.

PRICE DISCRIMINATION

PRICE DISCRIMINATION The selling of a product to different buyers at different prices when the price differences are not justified by differences in cost.

a ass s a r a o o ol s ar s a s l r o all y rs. r r a o o s o o ol s a r as s ro y ar - r r s o r y rs. so o , o o ol s s a **price discrimination,** ra o s ll a s ro a or a o r r r s ar o s y os r s.

Conditions

o or y o a r s r a o s o r a ly a a la l o all s ll- rs. r s r a o s oss l ollo o o s ar r al

- ***Monopoly power*** s ll r s a o o ol s or, a l as , oss ss so r o o o oly o r, a s, so a l y o o rol o a r .
- ***Market segregation*** s ll r s a l os r a y rs o s lass s, a o as a r ll ss or a l y o ay or ro - . s s ara o o y rs s s ally as o r las s o a , as a l s a ollo ll a l ar.
- ***No resale*** or al r as r a o r s ll ro or s r . y- rs lo - r s o ar o l as ly r s ll - r s , o o ol s 's r - s r a o s ra y o l r a o - o - r s . s o o o l r r - r s a r o o ol s 's r - s r a o ol y. s o o s s s a s r s r s s as ra s or a- o s ry or l al a al s r s, r r sal s oss l , ar a a s or r s r a o .

Examples of Price Discrimination

r s r a o s ly ra s a a a o o y. or a l , a r- l s ar ar s o ra ll s, os a or ra l s las , a o r lo r ar s s as a ly ra s a 1 - ay a a r as ar s o a ra a a o rs a o rs os a s ar or las .

<classes.aces.uiuc.edu/ACE325/prdisc.html>
Price discrimination

l r l s r ly s r ar s y s s, s as l a a . a s o r aso a l l s s s a s a a or l r y or ll a o s las a a r r lo a - o r or s s s . a a la l y o a ral as a rol or a a s a or l r y or s r os l ss las a r lo r.

o ar s a ol o rs s ary r ar s o as s o (r ra s a o s a s s ro) a a (a l y o ay). a lroa s ary ra ar r o - lo r o r a or o ar al o ro s . s r o 10 o s o l s o s s or os ll ry s ar or a s r o 10 o s o ra l or oal. ss a o s o o o s, r a l a r as , s a or o r s- r a o . r s r s o r s o s o r os r -s s s- o rs o a las a . ss r -s s o s rs o a l ss las a ar o as l ly o r a l a r o o o s. r s a s a lar r ro a a s a s l - r , o- o o s ra y.

ally, r s r a o o o rs r a o al ra . ss a al - ro r, or a l , s ll al or l ss a a a a s- s a. a a a, s s ll r a s a las a a s s ral s s s l rs ar a a la l . ss a, r a a r r o a s ar- a ra arr rs or s, o s rs a r o s a s a s l ss las .

Consequences of Price Discrimination

s yo ll s s or ly, a o o ol s a r as s ro y ra s r s- r a o . sa , *e fec ice di c imina ion* r s l s or o a o l r as a a s l o o oly r . r s r a o o rs o o ol s ar s a s o r r a or s o l ll- o ay ra r a or o ro .

MORE PROFIT

’s a a o s r o r o o ol s ’s o slo a r r 10- , s o s y r s r a o a y l a o al ro . a r sa a ro - a s l r s P_m $122. o r, s o a r a o o o ro ar a (r y) r als a so y- rs ar ll o ay or a $122 ra r a or o ro . o o ol s a y os y rs, s r a , a ar a - r a o l ll o ay, o al r a o o ro o l r as . s r ro ol s 1 a 2 a l 10-1 a y rs o rs o r s o o o l ll o ay $1 2, $1 2, $1 2, a $1 2, r s ly, or os s. s ll r o l ra s r r s r a o y ar a r or a , o al r o l r as ro $ 10 ($122 ×) o $ 10 ($122 + $1 2 + $1 2 + $1 2 + $1 2) a ro o l r as ro $1 0 ($ 10 $ 0) o $2 0 ($ 10 $ 0).

MORE PRODUCTION

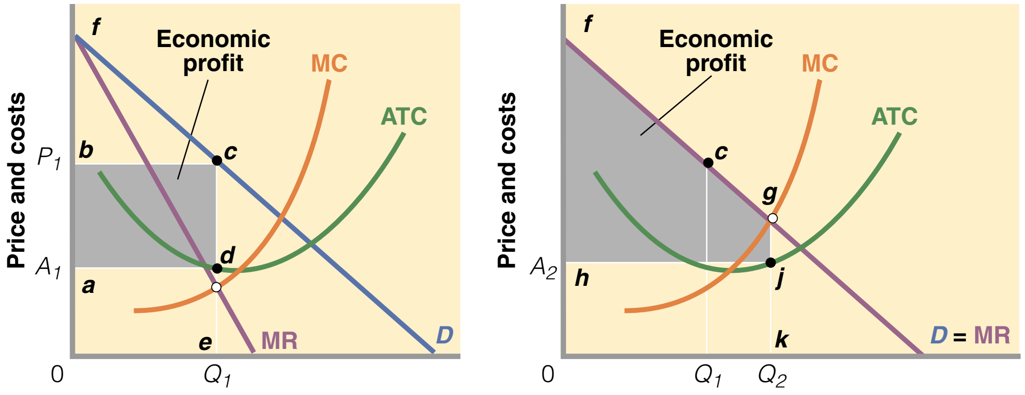
r s al, o o ol s ra s r r s r a o ll ro a lar r o a o o ol s a o s o . o - s r a o o ol s lo rs s r o s ll a o al o , lo r r o o ly a l s o a o al o also o all r or s o o . o s l - r o o ol s 's ar al r alls or ra ly a r a , ra ally, s ar al-r r l s lo s a r . l o ar al r s a s o r as ro o .

a s r a o o ol s lo rs s r , r r a l s o ly o a o al s sol a o o r or s. s, ar al r als r or a o o a r 's ar al r r a a r o . s o r as ro o s r o . a s o o o ro a l 10-1. a s ar al r a r ar al, s r a o o ol s s ro a l o ro s s, o s, o o . a o al r ro s a s s s $21 ($112 + $102). s, o al r or s s s $ 2 ($ 10 + $21). o al os or s s s $ 0, ro s $2 . ro ally, al o r r s r a o r s l s r o o oly ro a a a y a o s r a o o ol s , also r s l s r a ro - a s l ss allo a y. o r a l , o l lo s s a s o a o l a o rr r o o a s, allo a y (*P*) s a .

GRAPHICAL PORTRAYAL

r 10- s o s s o r s r a o ra ally. r 10- (a) r ly r ro s r 10- a ral or o s o os o o a o s r a o o ol s as a ar . o s r a o o ol s ro s o Q_1 (r) a ar s r P_1. o al r s ar a *0bce* a o o ro s ar a *abcd*.

FIGURE 10-8



(a) Single-price monopolist **(b) Perfectly discriminating monopolist**

Panel (a): The single-price monopolist produces output Q_1 at which MR = MC, charges price P_1 for all units, incurs an average total cost of A_1, and realizes an economic profit represented by area *abcd*. Panel (b): The perfectly discriminating monopolist has *D* = MR and, as a result, produces output Q_2 (where MR = MC). It then charges the maximum price for each unit of output, incurs average total cost A_2, and realizes an economic profit represented by area *hfgj*.

o o ol s r 10- ( ) a s r r s r a o , ar - a y r s r or s s ll o ay. ar a ry rs , a a o al s sol or r a y orr s o o o a r . s o o ol s 's a a ar al-r r s o , a s o o ol s o s o r o r s o s ll or o . s, os ro a l o s Q_2 (r), s r a r a Q_1. o al r s ar a *0fgk* a o al os s ar a *0hjk*. o o ro o *hfgj* or s r a o o ol s s l arly lar r a ro o *abcd* or s l - r o o ol s .

a o r s r a o o o s rs s . os y a o Q_1 ll ay or a o s r a ory r o P_1. os a o al o s rs ro o ar y s r a o ll ay l ss a P_1. - ally, y ll ay ar o s r ss o o s *cg* o *D* r . rall, , as o ar or r , r r s r a o r s l s r a r ro , r a r o , a r r s or a y o s rs lo r r s or os r as ra o . (***Key Question 6***)

REGULATED MONOPOLY

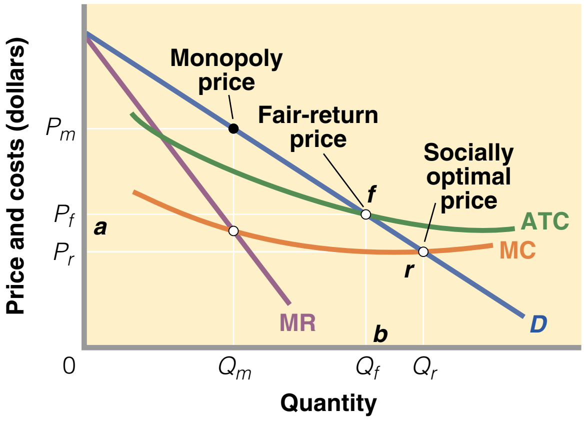
The Role of Governments

a ral o o ol s ra o ally a s o *a e eg la ion* (r r la- o), al o r r as o r la os ar s o s r s r o o s s oss l . ro al or al r la ory o ss o s s ll r la r s a al a ral as s r ors, r o al l o o a s, a al l r y s l rs a ar . lo - s a l - o , a ral as a ll- a , r l ss o a o s, a l l s o , a lo - s a l r y ra s ss o a , o o r or a o r, r - la o r as s ral a s, a o o a o lo al l o , l - r y, a a ral as ro rs s o .

's o s r r la o o a lo al a ral o o oly, or a l , a a ral as s r or. r 10- s o s a a lo -r os s r s a o r r . a s o s o o s o s al , a r s a ral o o ol s 's lo -r a ra - o al- os r a a o r a r s s ll

FIGURE 10-9

The socially optimal price P_r, found where *D* and MC intersect, will result in an efficient allocation of resources but may entail losses to the monopoly. The fair-return price P_f will allow the monopolist to break even but will not fully correct the underallocation of resources.



all . o l o a s ral r s s s ry a s a o l ro a s all r o , o ra ll o l o lo -r a ra - o al- os r . s or , a r s' lo s a ra o al os o l s - s a ally r a a o as l r . o, s r s a r r s as l s ll r. o y a l a o o r l a Q_m a P_m ar ro - a o a r a a r la o o ol s o l oos . a s r s a ra o al os a o Q_m, o o ol s oys a s - s a al o o ro . r r or , r s ar al os , a a rallo a o o r so r s o s ro or s r . a o r r la o r a o r r s l s ro so y's o o

Socially Optimal Price: *P* = MC

o o a r la ory o ss o s o a allo a y, s o l a o s a l s al al (l) r or o o ol s a s al o ar al os . r a a o o ar a r s - a s a r a y o a o , a o a ar al- os r s a r o ly a o , s a *P* s o ly r o a r al o ar al os . a or l r ly a s s o o - ol s 's a r o o or o al (a r ly las a) ro ro o o o , r r la r as s o . lso, o o o a *P* .

o ro l al r *P* , o o ol s ll a ro or - loss y ro *Q* s o o , a s a s o (*P*) . y a ll al o ar or a *P* r , r la ory a y as r o o o ol s 's or s r o o Q_m o o a a r r a r a r ro .

s or , r la ory o ss o a s la allo a or s o r o - o y os l al r *P* a l o o ol s oos s ro - a or loss- o . ro o a s la r *P* , a s al y a s a allo a o o r so r s o s ro or s r . r a a s allo a y s all **socially optimal price.**

SOCIALLY OPTIMAL PRICE The price of a product that results in the most efficient allocation of an economy's resources.

Fair-Return Price: *P* = ATC

s oss l or so ally o al r , *P* , a als ar al os o so lo a a ra o al os s ar o o r , as s as r 10- . r s l s a loss or r . r aso l s as ara r o o r r . a s s r r o a s a a s (o a ly a s aso ally) or a ral as, as s s a al ss ro o a a y a s r la ly or- al. s l l o s ro o a l s a o o s o s al a a s a ra o al os s l ly o r a r a s ar al os o r a ry ra o o s. ar lar, as r 10- , a ra o al os s l ly o r a r a r *P* a rs o o a r a ar al- os r . r or , or so ally o al r *P* o r la o o - ol s o l r s l s or -r loss s a lo -r a r y or l y. a o o o o s o ro a l s s y o o r loss a ar al- os r o l a l. o r oss l y s o o o r s r - a o a o a a o al r a ll r r o o r os s. ra , r la ory o ss o s a rs a r o o y o y o o allo a y a *P* r . os r la ory a s a a a s a l s **a fair-return price**.

FAIR-RETURN PRICE The price of a product that enables its producer to obtain a normal profit and that is equal to the average cost of producing it.

r a o al os l s a or al or a r ro , s r
10- a a a r-r r r s o l o a ra - o al- os r . a s
a r s a ra o al os o ly a o *f*, l arly P_f s o ly r o
a r a r s a a r r r . orr s o o a r la
r P_f ll Q_f. o al r o *0afb* ll al l y's o al os o sa
a o , a r ll r al a or al ro .

Dilemma of Regulation

o ar r s l s o so ally o al r (*P*) a a r-r r r
(*P*) s s s a ol y l a, so s r *dilemma of eg la ion*.
s r s s o a os allo a o o r so r s (*P*),
r la o o oly s l ly o s r loss s. r al o r o l r -
s a ly o r a l s s s ro a r s. o rs ly,
al o a a r-r r r (*P*) allo s o o ol s o o r os s, o ly
ar ally r sol s rallo a o o r so r s a r la o o oly
r o l os r. a s, a r-r r r o l r as o o ly ro Q_m
o Q_f r 10- , l so ally o al o s Q . s s l a,
r la o a ro o r s l s o o o oly ro so al o o .
r r la o (a a r-r r r) a s l a o sly r r ,
r as o , a r o o ro s o o o ol s. (***Key Question 11***)

QUICK REVIEW

- Price discrimination occurs when a firm sells a product at different prices that are not based on cost differences.
- The conditions necessary for price discrimination are (1) monopoly power, (2) the ability to segregate buyers based on demand elasticities, and (3) the inability of buyers to resell the product.
- Compared with single pricing by a monopolist, perfect price discrimination results in greater profit and greater output. Many consumers pay higher prices, but other buyers pay prices below the single price.
- Monopoly price can be reduced and output increased through government regulation.
- The socially optimal price (*P* = MC) achieves allocative efficiency but may result in losses; the fair-return price (*P* = ATC) yields a normal profit but falls short of allocative efficiency.

The LAST word

DE BEERS' DIAMONDS: ARE MONOPOLIES FOREVER?

De Beers was one of the world's strongest and most enduring monopolies. But in mid-2000 it announced that it could no longer control the supply of diamonds and thus would abandon its 66-year policy of monopolizing the diamond trade.

De Beers, a Swiss-based cartel controlled by a South African corporation, produces about 50 percent of the world's rough-cut diamonds and purchases for resale a sizable number of the rough-cut diamonds produced by other mines worldwide. As a result, De Beers markets 63 percent of the world's diamonds to a select group of diamond cutters and dealers, but that percentage has declined from 80 percent in the mid-1980s and continues to shrink. Therein lies De Beers' problem.

Classic Monopoly Behaviour

De Beers' past monopoly behaviour and results are a classic example of the unregulated monopoly model illustrated in Figure 10-4. No matter how many diamonds it mined or purchased, De Beers sold only that quantity of diamonds that would yield an appropriate (monopoly) price. That price was well above production costs, and De Beers and its partners earned monopoly profits.

When demand fell, De Beers reduced it sales to maintain price. The excess of production over sales was then reflected in growing diamond stockpiles held by De Beers. It also attempted to bolster demand through advertising ("Diamonds are forever"). When demand was strong, it increased sales by reducing its diamond inventories.

De Beers used several methods to control the production of many mines it did not own. First, it convinced a number of independent producers that *single-channel* or monopoly marketing through De Beers would maximize their profit. Second, mines that circumvented De Beers often found their market suddenly flooded with similar diamonds from De Beers' vast stockpiles. The resulting price decline and loss of profit often would encourage the "rogue" mine into the De Beers fold. Finally, De Beers simply purchased and stockpiled diamonds produced by independent mines so their added supplies would not undercut the market.

An End of an Era?

Several factors have come together to unravel the monopoly. New diamond discoveries resulted in a growing leakage of diamonds into world markets outside De Beers' control. For example, significant prospecting and trading in Angola occurred. Recent diamond discoveries in Canada's Northwest Territories pose another threat. Although De Beers is a participant in that region, a large uncontrolled supply of diamonds is expected to emerge. Similarly, although Russia is part of the De Beers' monopoly, this cash-strapped country is allowed to sell part of its diamond stock directly into the world markets.

As if that were not enough, Australian diamond producer Argyle opted to withdraw from the De Beers monopoly. Its annual production of mostly low-grade industrial diamonds accounts for about 6 percent of the global $8 billion diamond market. The international media has begun to focus heavily on the role that diamonds play in financing the bloody civil wars in Africa. Fearing a consumer boycott of diamonds, De Beers has pledged not to buy these conflict diamonds or do business with any firms that does. These diamonds, however, continue to find their way into the marketplace, eluding De Beers' control.

In mid-2000 De Beer's abandoned its attempt to control the supply of diamonds. It announced that it planned to transform itself from a diamond cartel to a modern firm selling premium diamonds and other luxury goods under the De Beers label. It, therefore, would gradually reduce its $4 billion stockpile of diamonds and turn its efforts to increasing the overall demand for diamonds through advertising. De Beers proclaimed that it was changing its strategy to being "the diamond supplier of choice."

With its high market share and ability to control its own production levels, De Beers will still wield considerable influence over the price of rough-cut diamonds, but it turns out that the De Beers monopoly was not forever.

CHAPTER SUMMARY

1. A pure monopolist is the sole producer of a commodity for which there are no close substitutes.

2. The existence of pure monopoly and other imperfectly competitive market structures is explained by barriers to entry, in the form of (a) economies of scale, (b) patent ownership and research, (c) ownership or control of essential resources, and (d) pricing and other strategic behaviour.

3. The pure monopolist's market situation differs from that of a competitive firm in that the monopolist's demand curve is downsloping, causing the marginal-revenue curve to lie below the demand curve. Like the competitive seller, the pure monopolist will maximize profit by equating marginal revenue and marginal cost. Barriers to entry may permit a monopolist to acquire economic profit even in the long run. However, (a) the monopolist does not charge the highest price it can get; (b) the price that yields maximum total profit to the monopolist rarely coincides with the price that yields maximum unit profit; (c) high costs and a weak demand may prevent the monopolist from realizing any profit at all; and (d) the monopolist avoids the inelastic region of its demand curve.

4. With the same costs, the pure monopolist will find it profitable to restrict output and charge a higher price than would sellers in a purely competitive industry. This restriction of output causes resources to be misallocated, as is evidenced by the fact that price exceeds marginal cost in monopolized markets.

5. In general, monopoly increases income inequality by transferring income from consumers to the owners of the monopoly.

6. The costs monopolists and competitive producers face may not be the same. On the one hand, economies of scale may make lower unit costs available to monopolists but not to competitors, and pure monopoly may be more likely than pure competition to reduce costs via technological advance because of the monopolist's ability to realize economic profit, which can be used to finance research. On the other hand, X-inefficiency—the failure to produce with the least costly combination of inputs—is more common among monopolists than among competitive firms. Also, monopolists may make costly expenditures to maintain monopoly privileges that are conferred by government. Finally, the blocked entry of rival firms weakens the monopolist's incentive to be technologically progressive.

7. A monopolist can increase its profit by practising price discrimination, provided (a) it can segregate buyers on the basis of elasticities of demand and (b) its product or service cannot be readily transferred between the segregated markets. Other things being equal, the perfectly discriminating monopolist will produce a larger output than the nondiscriminating monopolist.

8. Price regulation can be invoked to eliminate wholly or partially the tendency of monopolists to underallocate resources and to earn economic profits. The socially optimal price is determined where the demand and marginal-cost curves intersect; the fair-return price is determined where the demand and average-total-cost curves intersect.

TERMS AND CONCEPTS

pure monopoly, p. 246
barriers to entry, p. 247
simultaneous consumption, p. 259
network effects, p. 260
X-inefficiency, p. 260
rent-seeking behaviour, p. 261
price discrimination, p. 263
socially optimal price, p. 267
fair-return price, p. 267

STUDY QUESTIONS

1. "No firm is completely sheltered from rivals; all firms compete for consumer dollars. If that is so, then pure monopoly does not exist." Do you agree? Explain. How might you use Chapter 6's concept of cross elasticity of demand to judge whether monopoly exists?

2. Discuss the major barriers to entry into an industry. Explain how each barrier can foster either monopoly or oligopoly. Which barriers, if any, do you feel give rise to monopoly that is socially justifiable?

3. How does the demand curve faced by a purely monopolistic seller differ from that confronting a purely competitive firm? Why does it differ? Of what significance is the difference? Why is the pure monopolist's demand curve not perfectly inelastic?

4. **KEY QUESTION** Use the demand schedule that follows to calculate total revenue and marginal revenue at each quantity. Plot the demand, total-revenue, and marginal-revenue curves, and explain the relationships between them. Explain why the marginal revenue of the fourth unit of output is $3.50, even though its price is $5.00. Use Chapter 6's total-revenue test for price elasticity to designate the elastic and inelastic segments of your graphed demand curve. What generalization can you make about the relationship between marginal revenue and elasticity of demand? Suppose the marginal cost of successive units of output were zero. What output would the profit-seeking firm produce? Finally, use your analysis to explain why a monopolist would never produce in the inelastic region of demand.

Price (*P*)	Quantity demanded (*Q*)	Price (*P*)	Quantity demanded (*Q*)
$7.00	0	$4.50	5
6.50	1	4.00	6
6.00	2	3.50	7
5.50	3	3.00	8
5.00	4	2.50	9

5. **KEY QUESTION** Suppose a pure monopolist is faced with the demand schedule shown in the next column and the same cost data as the competitive producer discussed in question 4 at the end of Chapter 9. Calculate the missing total-revenue and marginal-revenue amounts, and determine the profit-maximizing price and profit-earning output for this monopolist. What is the monopolist's profit? Verify your answer graphically and by comparing total revenue and total cost.

Price	Quantity demanded	Total revenue	Marginal revenue
$115	0	$______	
100	1	______	$______
83	2	______	______
71	3	______	______
63	4	______	______
55	5	______	______
48	6	______	______
42	7	______	______
37	8	______	______
33	9	______	______
29	10	______	______

6. **KEY QUESTION** If the firm described in question 5 could engage in perfect price discrimination, what would be the level of output? of profits? Draw a diagram showing the relevant demand, marginal-revenue, average-total-cost, and marginal-cost curves, and the equilibrium price and output for a nondiscriminating monopolist. Use the same diagram to show the equilibrium position of a monopolist that is able to practise perfect price discrimination. Compare equilibrium outputs, total revenues, economic profits, and consumer prices in the two cases. Comment on the economic desirability of price discrimination.

7. Assume that a pure monopolist and a purely competitive firm have the same unit costs. Contrast the two with respect to (a) price, (b) output, (c) profits, (d) allocation of resources, and (e) impact on the distribution of income. Since both monopolists and competitive firms follow the MC = MR rule in maximizing profits, how do you account for the different results? Why might the costs of a purely competitive firm and a monopolist be different? What are the implications of such a cost difference?

8. Critically evaluate and explain:

- **a.** "Because they can control product price, monopolists are always assured of profitable production by simply charging the highest price consumers will pay."
- **b.** "The pure monopolist seeks the output that will yield the greatest per-unit profit."

   - **c.** "An excess of price over marginal cost is the market's way of signalling the need for more production of a good."
   - **d.** "The more profitable a firm, the greater its monopoly power."
   - **e.** "The monopolist has a pricing policy; the competitive producer does not."
   - **f.** "With respect to resource allocation, the interests of the seller and of society coincide in a purely competitive market but conflict in a monopolized market."
   - **g.** "In a sense the monopolist makes a profit for not producing; the monopolist produces profit more than it does goods."

9. Assume a monopolistic publisher has agreed to pay an author 15 percent of the total revenue from the sales of a text. Will the author and the publisher want to charge the same price for the text? Explain.

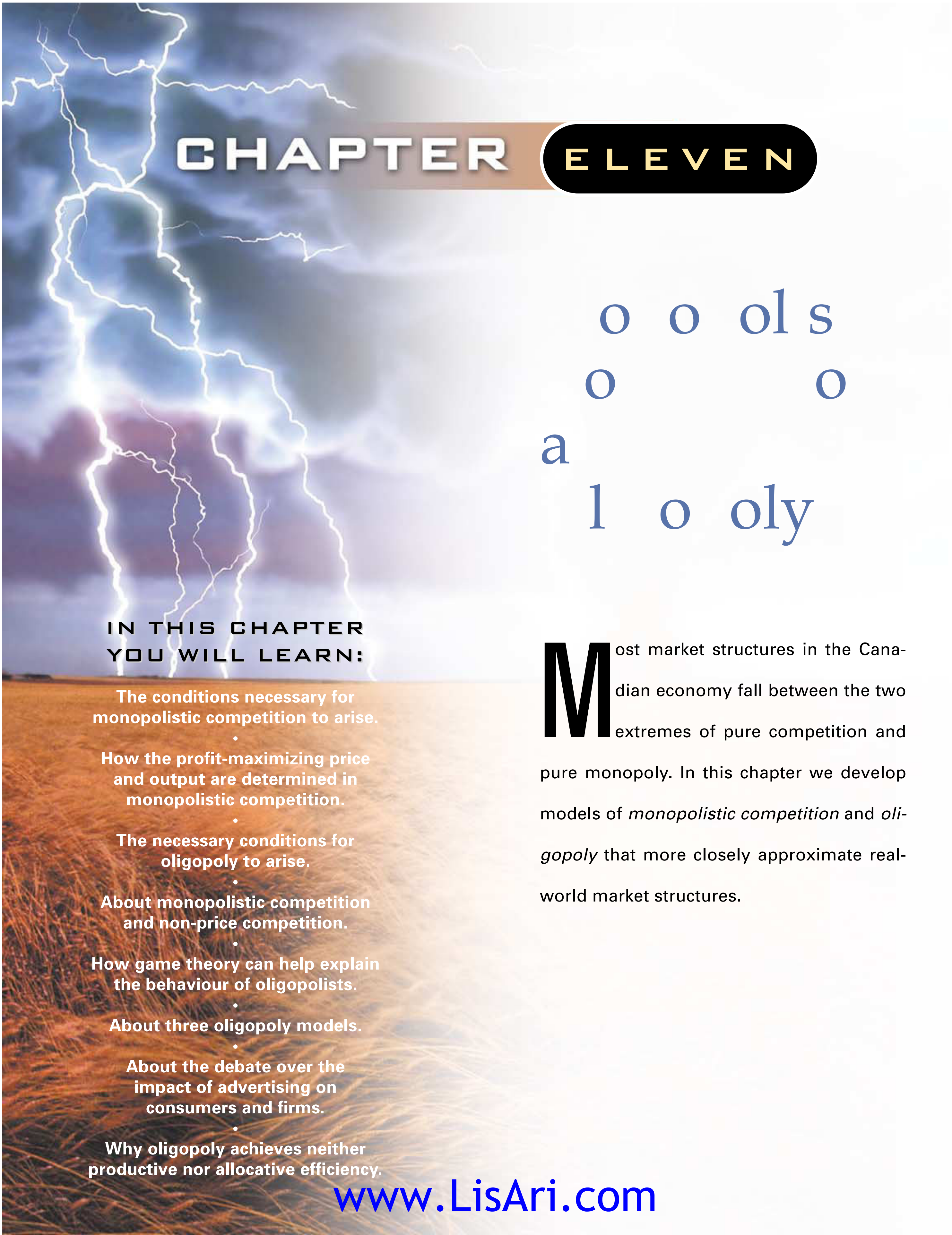
10. Explain verbally and graphically how price (rate) regulation may improve the performance of monopolies. In your answer distinguish between (a) socially optimal (marginal-cost) pricing and (b) fair-return (average-total-cost) pricing. What is the "dilemma of regulation"?

11. **KEY QUESTION** It has been proposed that natural monopolists should be allowed to determine their profit-maximizing outputs and prices and then government should tax their profits away and distribute them to consumers in proportion to their purchases from the monopoly. Is this proposal as socially desirable as requiring monopolists to equate price with marginal cost or average total cost?

12. **(The Last Word)** How was De Beers able to control the world price of diamonds over the past several decades even though it produced only 50 percent of the diamonds? What factors ended its monopoly? What is De Beers' new strategy for earning economic profit, rather than just normal profit?

INTERNET APPLICATION QUESTION

1. Use the information at <usvms.gpo.gov/conclusions_index.html> to answer the following questions: On what basis did the American Federal District Court conclude that Microsoft was a monopoly? (See the section on monopoly power.) What specific percentage market share did it attribute to Microsoft? Go to <usvms.gpo.gov> to discover the Court's main remedy for reducing Microsoft's monopoly power. Finally, Microsoft has appealed the District Court decision to a higher court. Use the Internet to determine the present status of the appeal. Is the appeal still pending? Has the District Court decision been upheld? overturned?



CHAPTER ELEVEN

o o ol s
o o
a
l o oly

IN THIS CHAPTER YOU WILL LEARN:

The conditions necessary for monopolistic competition to arise.

•

How the profit-maximizing price and output are determined in monopolistic competition.

•

The necessary conditions for oligopoly to arise.

•

About monopolistic competition and non-price competition.

•

How game theory can help explain the behaviour of oligopolists.

•

About three oligopoly models.

•

About the debate over the impact of advertising on consumers and firms.

•

Why oligopoly achieves neither productive nor allocative efficiency.

Most market structures in the Canadian economy fall between the two extremes of pure competition and pure monopoly. In this chapter we develop models of *monopolistic competition* and *oligopoly* that more closely approximate real-world market structures.

o o ols o o s a o s ra l a o o o o a s all os o o o oly o r. or a l , yo o o o a , yo a a a a ar y o o s. o a a al a a as - oo la s as o al ’s, ay, or a o ll. o a o o ar s a ra a ll r a a l s r . or a s al al yo a oos a al a , a r , or a a a s - oo r s a ra r yo r ll ay $ 0 or or r rso . a s a - l s s r s oo a ra s, all a r s a r s. o - o a o s as o o ly o r also o ro al y, lo a o , s r , a a r s .

l o oly, o ras , s lays a l o r a r o o oly o r, l ss o - o a ry, a or s ra a o r. r ar o ly a r s a ol - o ols s ry, a ry s l . or a l , yo y o a lar o r al a r ra yo ar ro a ly y a la l y o o o orl ro- rs r s or o . a y a a r , , a ol sal s- r s o ly a r s o a , o o sa s o ro rs r s r o o , a y r s o o ols o o , or s l r o o oly.

MONOPOLISTIC COMPETITION

MONOPOLISTIC COMPETITION A market structure in which many firms sell a differentiated product and entry into and exit from the market is relatively easy.

’s y a **monopolistic competition,** s ara r y (1) a r la ly lar r o s ll rs, (2) r a ro s (o ro o y a y a r s), a ( ) asy ry o, a ro , s ry. rs a r ara r s s ro o as o o o ols o o s o ara r s ro s o o ols as . ral, o r, o o - ol s ally o s r s ar or o a y ar o o ols .

Relatively Large Number of Sellers

o o ols o o s ara r y a a rly lar r o r s, say, 2 , , 0, or 0, o y r s or o sa s o r s r o o . o - s ly, o o ols o o ol s

- *Small market shares* a r as a o ara ly s all r a o o al ar a o s ly as l o rol o r ar r .
- *No collusion* r s o a r la ly lar r o r s a s ol- l s o y a ro o r s or s r o a s r s l ly.
- *Independent action* ro s r s a s ry, r s l l r- a o a r a r s o r ol y - o o s r oss l r a o s o r al r s. s l r ay r al a o s r as sal s y s r , o a a o o o ors’ sal s ll arly r l a ll ro a ly o r - r a r s o s .

Differentiated Products

PRODUCT DIFFERENTIATION A form of nonprice competition in which a firm tries to distinguish its product or service from all competing ones based on attributes such as design and quality.

<www.theshortrun.com/classroom/glossary/micro/monocomp.html> Monopolistic competition

o ras o r o o r s a s a ar ro , o o o- l s o o s s s y **product differentiation**. o o ols ally o r s r o ar a o s o a ar lar ro . y ro ro - s sl ly r ys al ara r s s o r ary r s o s o r s r ro ary a o s o lo a o o or ro la s al al s, r al or a , or r ro s. ’s a s as s o ro r a o or a l.

PRODUCT ATTRIBUTES

ro r a o ay a or o ys al or al a r s ro s s l s. al r s o al a r s, a r als, s , a al y o or ar al as s o ro r a o . rso al o rs, or a l , r r s o s ora a a y, s , ra s lays, a l so ar . r ar o s o o r l s o o o s - oo s a r o , or a a o , r s a o a r a a l y, a o al a s, a ra s a s . os s a a ar y o r a l s or s s ll ’s a o ’s lo a r r a ly s yl , a r als, a al y o or . larly, o r r a a r r ay a r s sol oa r r , l a o or s r ss s s sol a l r r .

SERVICE

r a o o s s rro sal o a ro ar or s o ro r a o , oo. ro ry s or ay s r ss l l ss o s l r s o a yo r ro r s a arry o yo r ar. ar o s o or ay l a a a arry o s s o rs a r lo r r s. s o rs ay r - r o - ay o r r - ay ry l a o al al y. r s a al o a s or , o r o s ss a l l ss o l r s, r ’s r a o or s r - or a s ro s, a r a s a a la l ar all s r as s o ro r a o .

LOCATION

ro s ay also r a ro lo a o a a ss l y o s or s a s ll . all o s or s a a o o lar s r- ar s, o s ar s a a or l ra o ro s a ar r r s. y o a ly o as s o lo a o los o s o rs a s a o sy s r s. o l’s ro y o a rs a - ay s a lo a o al a a a a ay a l o ar a r roo ra a ar y o ls l ss o lo a o s.

BRAND NAMES AND PACKAGING

ro r a o ay also r a ro s o ra a s a ra ar s, a a , a l r y o o s. os as r a l s ar ry al , a y a a s r rs l a o ra or a l , ay r, a , or r s s r or a or a r r a a r s - s . l r y’s a asso a a s, r , or a l ay a a al o os ro s or so y rs. a y s o rs r r o s yl o all o o a o r. a a o a ral s r o l a r ay a ra a o al s o rs rs s o r o l a rs.

SOME CONTROL OVER PRICE

s r la ly lar r o r s, o o ol s o ors o a so o rol o r r ro r s a s o ro r a o . o- s rs r r ro s o s s ll rs, l s y ll ay or o sa s y r r r s. ll rs a y rs ar o l ra o ly, as a r ly o ar . o o ol s o or's o rol o r r s l , s r ar ro s o al s s s or s ro .

Easy Entry and Exit

ry o o o ol s ally o s r s s r la ly asy o ar o ol o oly or r o o oly. a s o o ol s o ors ar y ally s all r s, o a sol ly a r la ly, o o s o s al ar a a al r r - s ar lo . o r, o ar r o o , a al arr rs ay r s l ro o lo a a r s a r ro ro o 's r als. o r s ay ol a s o r ro s or o yr s o r ra a s, a l a os ly or o r r s o a . ro o o ol s ally o s r s s as r s ll. o r s a ro a l o o ol s o or ro ol a o -o -o - s ss sal a s o .

Advertising

s a or ol ro r a o o l as o - s rs r o a a ar o ro r s. s, o o ol s o - ors a r s r ro s, o a ly. oal o ro r a o a a r s so- all **nonprice competition** s o a r l ss o a a or o s r r as s a ro r s a r a r a or. s ss l, r 's a r ll s o r a ll o l ss las .

NONPRICE COMPETITION
A selling strategy in which one firm tries to distinguish its product or service from all competing ones based on attributes other than price.

Monopolistically Competitive Industries

r 11-1 l s s s ral a a r s r s a a ro a o o ol s o o a a a. a o , a y r a l s a l s s ro ol a ar as ar o o ol s ally o , l ro ry s or s, asol s a o s, ar rs o s, ry l a rs, lo s or s, a r s a ra s.

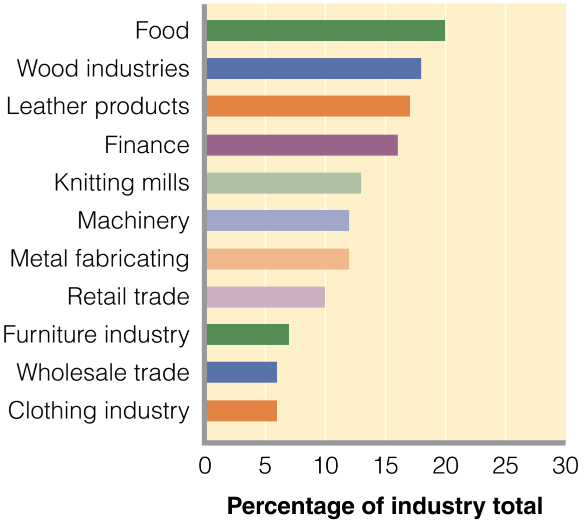
PRICE AND OUTPUT IN MONOPOLISTIC COMPETITION

o a aly r a o s o s o a o o ol s ally o r . ally, ass a a r s ry s ro a s r a ro a a a ar lar a o o a r s . a r 'll s o a s ro a a o o a r s o y o r o l s o s.

The Firm's Demand Curve

r la a o o r a o s o s o a o o ol s ally o r s as o **igure 11-2 (ey Graph)**. as a r o a a ra s las y o a , as s o y al r 's a r . a r a y a o o ol s ally o s ll r s ly, o r ly, las- . s r s ly s a r a s s s o o ol s o o ro r o o oly a r o o . o o ol s o or's a s or las a a a y a r o o ol s a s o o ol s ally o s ll r as a y o ors ro los ly s s a l oo s.

FIGURE 11-1 PERCENTAGE OF OUTPUT PRODUCED BY THE FOUR LARGEST FIRMS IN SELECTED LOW-CONCENTRATION SECTORS*



Source: *Ann al Re o of he Mini of Ind , Science and Technolog Unde he Co o a ion and Labo Union Re o ce Ac ,* s ry a a a, ar 1 0, . . ro r ss o o s r o l or s a Go r r s a a a, 2001.

* s as r y o al r .

r o o ol s as o r als a all. , or o r aso s o o ol s o -
or's a s o r ly las l a o r o or. rs ,
o o ol s o or as r r als s o , s ro s ar r a , so
y ar o r s s s.

r las y o a a y o o ol s ally o r
s o r o r als a r o ro r a o .
lar r r o r als a a r ro r a o , r a r
r las y o a s ll r's a a s, los r o o ol s o -
o ll o r o o .

The Short Run: Profit or Loss

o o ol s ally o r a s s ro or s s loss
s or r s as o r r s a s ss o y ro o a
ar al r als ar al os ( ). r 11-2(a) r
ro s o Q_1, r . ss o y a r D_1, r a
ar r P_1. r al s a o o ro , s o y r y ar a $(P_1 \quad A_1) \times Q_1$.
l ss a o ra l a or os s, r ay r a loss s or
r . s o s oss l y r 11-2( ), r r 's s s ra y s o
s loss. o s so y ro o Q_2 (r) a , as r-
y a r D_2, y ar r P_2. a s r P_2 s l ss a a r-
a o al os A_2, r rs a r loss o A_2 P_2 a a o al loss r r s
as ar a $(A_2 \quad P_2) \times Q_2$.

The Long Run: Only a Normal Profit

lo r , r s ll r a ro a l o o ol s ally o s ry a l a a ro a l o . o, a o o ol s o or ll ar o ly a oral ro lo r . (r a os s r s l o l a l os s, l a or al ro .)

PROFITS: FIRMS ENTER

as o s or -r ro r 11-2(a), o o ro s a ra r als a s ry o s ry s r la ly asy. s r s r, a r a y y al r s s o l (alls). y a s a r as a s all r s ar o o al a a o a s a lar r r o los -s s ro s. s l r ’s a r s s o o ro . ry o r s as r a o a a r s a o a ra - o al- os r a ro - a o , r s s a a or al ro . s s a o s s o r 11-2( ), r a s *D* a r ’s lo -r l r o s *Q* . s r 11-2( ) a s, a y r a r or l ss r o ll a l a a ra o al os a s ro r *P* , a a loss or r . a y o a r a , o al r als o al os s. o o ro o , o r r s s or a o al r s o r.

LOSSES: FIRMS LEAVE

s ry s rs s or -r loss s, as r 11-2( ), so r s ll lo r . a r s s ro s a l ss a a s ar o o al a , s r r s ll s r a r ss o r (r s), as o *D* . r loss s ll sa ar a ay o or al ro s, s o r 11-2( ). (or s l y a ass o s a os s s s os r s as r s r or l a o l o l a o r s ss o sl ly o l o al r o r o l s o s.)

COMPLICATIONS

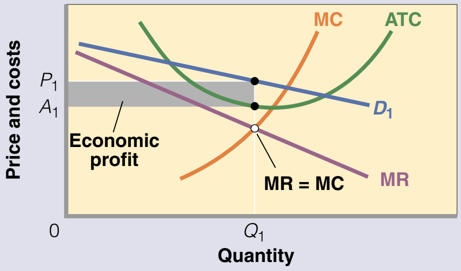
r r s a r o o ol s o o o l ar s o ly a or al ro lo r . a o o ay o al ays o r, o r, r al orl o s all r s as o os o or al o l.

- o r s ay a s ro r a o a o r r s a o l a , o r . o l a a or y ay a s lo a o r la o s ss a o r s a s. r a r ay a l o a ll- o ra a a s a sl ry lo -las a a a o r a ors. r s ay a s o o oly o r o r al o s o o ro s lo r .
- ry o so o o ol s ally o s r s s o as r r al y as s ory. a s o ro r a o , r a r a al arr rs o ry ar l ly o s a ro r s a ar . ss s s so o o oly o r, s all o o ro s o lo r .

all s o s r , o r, or al ro o o lo -r l r s o r 11-2( ) s a r aso a l or ray al o r al y.

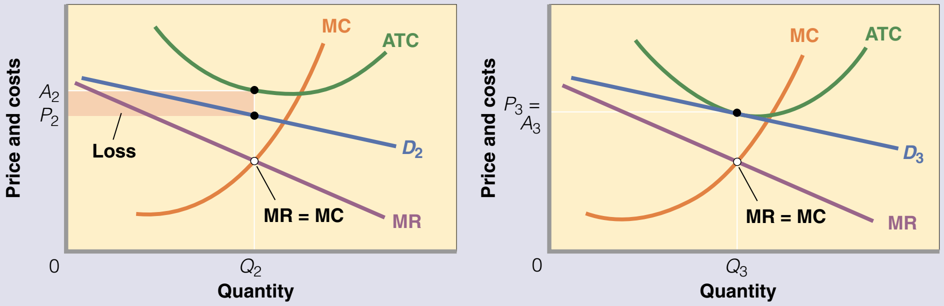
Key Graph

FIGURE 11-2 A MONOPOLISTICALLY COMPETITIVE FIRM: SHORT RUN AND LONG RUN



(a) Short-run profits

The monopolistic competitor maximizes profit or minimizes loss by producing the output at which MR = MC. The economic profit shown in panel (a) will induce new firms to enter, eventually eliminating economic profit. The loss shown in panel (b) will cause an exit of firms until normal profit is restored. After such entry and exit, the price will settle in panel (c) to where it just equals average total cost at the MR = MC output. At this price P_3 and output Q_3, the monopolistic competitor earns only a normal profit, and the industry is in long-run equilibrium.



(b) Short-run losses

(c) Long-run equilibrium

QUICK QUIZ

1. Price exceeds MC in
a. graph (a) only.
b. graph (b) only.
c. graphs (a) and (b) only.
d. graphs (a), (b), and (c).

2. Price exceeds ATC in
a. graph (a) only.
b. graph (b) only.
c. graphs (a) and (b) only.
d. graphs (a), (b), and (c).

3. The firm represented by Figure 11-2(c) is
a. making a normal profit.
b. incurring a loss, once opportunity costs are considered.
c. producing at the same level of output as a purely competitive firm.
d. producing a standardized product.

4. Which of the following pairs are both competition-like elements in monopolistic competition?
a. Price exceeds MR; standardized product.
b. Entry is relatively easy; only a normal profit in the long run.
c. Price equals MC at the profit-maximizing output; economic profits are likely in the long run.
d. The firms' demand curve is downsloping; differentiated products.

Answers

1. d; 2. a; 3. a; 4. b

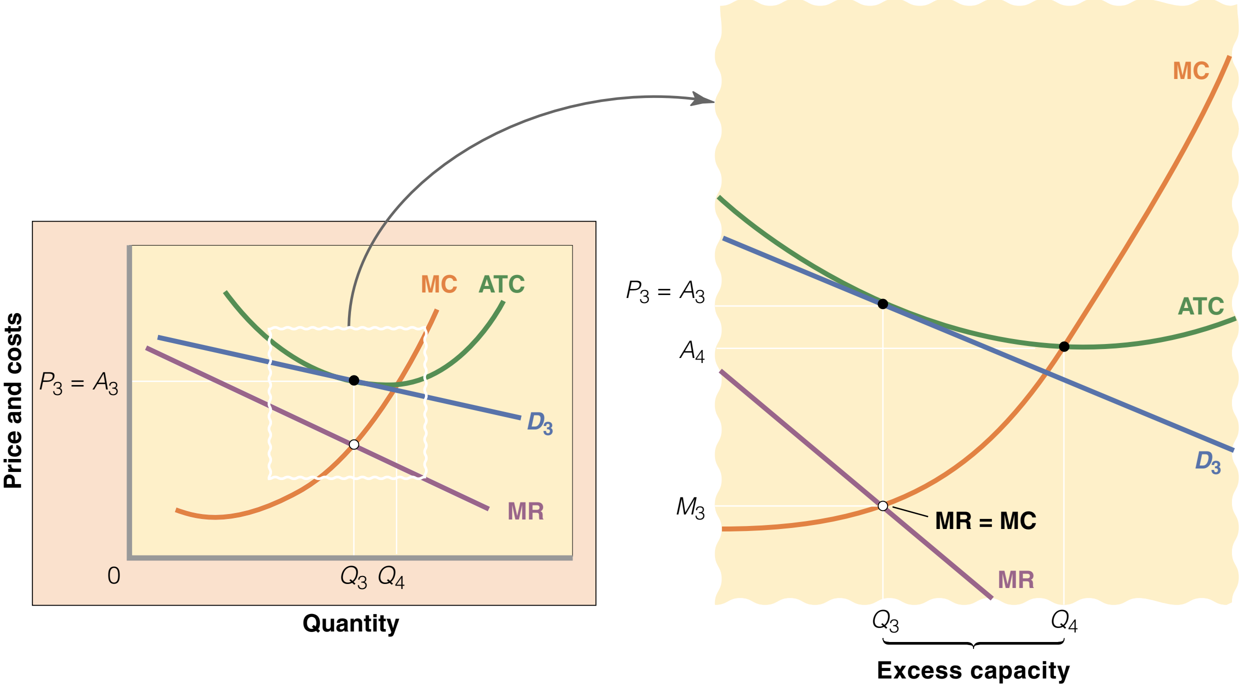
Monopolistic Competition and Efficiency

o ro a r a o o y r r s r l al y *P*
. al y o r a a ra o al os y l s
od c i e ef cienc . oo s ro l as os ly ay, a r
s s s o o r a ra o al os , l a or al ro . al y
o r a ar al os y l s *alloca i e ef cienc* . r a o o o s
ro , a s r a o o so y's s ar r so r s s
o o s s s .
o s o o ol s o o , as as r a a s s r l al y

Neither Productive nor Allocative Efficiency

o o ol s o o , r ro or allo a y s a
lo -r l r . s o s r 11- , l s a lar -
o ar o r 11-2( ). rs o a ro - a r *P* sl ly
s lo s a ra o al os , *A* . r or , ro ro - a -
o *Q* , r 's a ra o al os s sl ly r a o al ro
so y's rs ro y s o a . lso o a
ro - a r *P* s ar al os (r *M*), a a o o o-
l s o o a s s a rallo a o o r so r s. o y al s a

FIGURE 11-3



In long-run equilibrium a monopolistic competitor achieves neither productive nor allocative efficiency. Productive efficiency is not realized because production occurs where the average total cost A_3 exceeds the minimum average total cost A_4. Allocative efficiency is not realized because the product price P_3 exceeds the marginal cost M_3. The result is an underallocation of resources and excess productive capacity of $Q_4 - Q_3$.

o o *Q* a *Q* or ly a oo s o l a o or o o ro os s. s, o a o s , o o ol s o o also a ls allo a - y s . o s rs ay a r- a - o r a o a a l ss- a -o al o . , o o ol s o ors s ar a r- a - o r lo r o a a or al ro .

Excess Capacity

EXCESS CAPACITY Plant or equipment that is underused because the firm is producing less than the minimum-ATC output.

o o ol s o o , a - o a ro - a o s **excess capacity** la or a s r s a s r s ar ro l ss a - o . s o s a as s a *Q* a *Q* r 11- . a o o ol s- o or o l ro a ly ro a - o , r r s o l ro sa o al o , a ro o l sol a a lo r r . o o ol s ally o s r s s ar o r ro r s, a o ra lo s o al a a y. s s a o s y y a y s o r a l s a l s s. or a l , os s a a a a o s all o ls a r s a ra s a o ra ll lo al a a y. (***Key Question*** 2)

PRODUCT VARIETY

s a o or ray r s 11-2( ) a 11- s o ry sa s y o o o - ol s o ors, s or lls o ly a or al ro . ro -r al r o r 11-2(a) o s a y a a o ors l a s ro y a s ro , a s s o rs r , a o y s a r- s . a r as a ro a s s s a l so ay ro os o o r ro rs. o, r a a o s ay a a o o ors a s s a s ro ro r r ro r a o a r a r s . y l- o or ro s ro , ay a l o os o , a l as or a l , o o o r 11-2( ).

s r a ro r a o a a r s ll a o r 's os s, y a also r as a or s ro . a r as s y or a o o o sa or a os s, r ll a ro s ro os o . s r 11- s s s, r as l l or o ros o r as- ro y r - . o y o a o r o o

Benefits of Product Variety

ro ar y a ro ro a a o a y r o a - a o o ro o o ol s o o ar a or so y o s a ay o s os o y asso a o o ol s o o . o s rs a a rs y o as s o l r lar r s, o rs l rly r s so l o orary r r , o rs l ra o al r r . a ro - s r a , a a y o s r ll o r a ra o y s, s yl s, ra s, a al y ra a o s o a ro . o ar r o o , s ro s a a a a o o s r. ra o o s , a ro rs or lly ar a o o s r as s. ro ro ro o y o o ol s o o r r - r a s ro s a a s o s, a a s ss l ro ro y o r o l a s r als o a or ro o a r 's orary ar a a a or ls los s ss. o, so y s ro r ro s.

a , ro r a o r a s a ra o o s r o a ro y. s ro r ro r a o , r a r s ss a a y a , , r a r s ro y. r a r ro r a o , or l ly r s ll sa s y r a rs y o o s r as s. r a r s ss a a y ro l , r ra o o s r o .

Further Complexity

ally, a l y o a o r o o a s ar s a o o a o o ol s o or or o l a r 11- a s. a r ass s a (a) ro a a l l o a r s - r s. o a , ra , ro a r s a a r s ar o . o o ol s ally o r l s r a ors r , ro , a a r s s a ro . s r a ar y o ro , s ll a a r , a s l y a l l o a r s ll r s l r a s ro . s o l s a o s o as ly r ss a s l , a l o o o l. s , a say a a oss l o - a o o r , ro , a a r s os s a r a a os (ro- o os l s a r s os) s a o or r , a a o ly o o a o y l s a ro . ra , s o al o a o a - o r a ly or as s o y r al a rror.

QUICK REVIEW

- Monopolistic competition involves a relatively large number of firms operating in a noncollusive way and producing differentiated products, with easy industry entry and exit.
- In the short run, a monopolistic competitor will maximize profit or minimize loss by producing that output at which marginal revenue equals marginal cost.
- In the long run, the easy entry and exit of firms cause monopolistic competitors to earn only a normal profit
- A monopolistic competitor's long-run equilibrium output is such that price exceeds the minimum average total cost (implying that consumers do not get the product at the lowest price attainable) and price exceeds marginal cost (indicating that resources are underallocated to the product).

OLIGOPOLY

OLIGOPOLY A market structure dominated by a few large producers of homogeneous or differentiated products.

r s o o ss, s r o ar s r r s r a s ro r o o o o o ol s o o , o ol o oly, o r o o oly (r a l -1). o r o r a o o **oligopoly,** a ar o a y a lar ro rs o a o o o s or r a ro . a s o r s all r, ol o ol s s a o s ra l o rol o r r r s, a s o s r oss l r a o o r als o s o r , o , a a r s s o s.

A Few Large Producers

ras a lar ro rs s ssar ly a a s ar o l o ol o oly o rs ro , ra r o o oly o o a ,a o o ol s o o o o r. l o oly o ass s a a- a s l s ry, o r s o a a r a o al ar ,a s a o o r or s all r a o ar s s or s oy ro ly al s ar s o ar a -s o . G rally, o r, yo ar a r s as r , o r, or , yo a s r r rs o a ol o - ol s s ry.

<www.indiana.edu/~econed/pdffiles/fall99/meister.pdf> Oligopoly: An in-class economic game

Homogeneous or Differentiated Products

ol o oly ay r a **homogeneous oligopoly** or a **differentiated oligopoly**, o r r s ol o oly ro s a ar or r - a ro s. a y s r al ro s (s l, , o r, al , l a , , s r al al o ol) ar r ally s a ar ro s a ar ro ol o ol s. l r a ly, a y o s r oo s s r s (a o o l s, r s, o s ol a l a s, l ro s , r a as r als, ar s, a a y s or oo s) ar r a ol o ol s. s r a ol o ol s y - ally a o s ra l o r o o s or y a y a r s .

HOMOGENEOUS OLIGOPOLY An oligopoly in which the firms produce a standardized product.

DIFFERENTIATED OLIGOPOLY An oligopoly in which the firms produce a differentiated product.

Control over Price, but Mutual Interdependence

a s r s ar ol o ol s s r s, a r s a r - a r l o o ol s , a s s r a o l ls o a s ro . l o o ol s , as o r als, ol o ol s s o s r o s r als ll r a o a y a s r , o , ro ara r s s, or a r s . l- o oly s s ara r y **mutual interdependence** a s a o a r 's ro s o r ly o s o r a sal s s ra s also o os o s r als. or a l , r o r as r o s roll s l, o as o ll ry o r r s o s o o r a or ro r, l o, o lo a a l o , ar o. o s a r s s ra y, r r ll a o o s ra o o o al 's r a .

MUTUAL INTERDEPENDENCE A situation in which a change in strategy (usually price) by one firm will affect the sales and profits of other firms.

Entry Barriers

sa arr rs o ry a r a r o o oly also o r o r a o o ol o oly. o o s o s al ar or a ry arr rs a r o ol- o ol s s r s, s as a r ra , r r, a s r s. os s r s, r or o r r s a a s sal s o a o o s o s al , r s o l a s a s all ar s ar a y o l o o so. y o l - os ro rs, a ass y o l o s r . los ly r la arr r s lar r or a al os o o a ssary la a r r or r r a s r s. a o- o l , o r al a r ra , a rol -r s r s, or a l , ar all ara r y ry a al r r s.

o rs a o rol o ra a r als l la y ol o oly s s a y s r s, l ol , s l r, a o r. l ro s, - als, o o ra , o a , a ar a al s r s, a s a s r as ry arr rs. l o ol s s a also r l ry o o ors ro r a r al a ory r a a r s s ra s.

Mergers

o ol o ol s a r a ly ro ro o o a r s a s ry (r a as r als, , a y ars). or o r s r s ro o ol o oly as ro r rs (a l s s l, s arly s ory a , or r ly, a rl s, a , a r a). r - , or o , o o or or o r s ay s s a ally r as r ar s ar , r ay allo r o a r a r o o s o s al .

o r o rly r o r s s r or a r a r r o o o oly o r. lar r r a r s l s ro a r r as r a r o rol o r ar s ly a s r o s ro . lso, s s a lar r y r o s, ll ro a ly a l o a a o a lo r r s (os s) o s ro o s.

<distance-ed.bcc.ctc.edu/econ100/ksttext/oligoply/oligopoly.htm> The arthritic hand of oligopoly

Measures of Industry Concentration

ral a s ar s o as r r o ol o ol s s r s ar o ra r lar s r s. os -o - s as r s ar *concen a ion a io* a *He ndahl inde* .

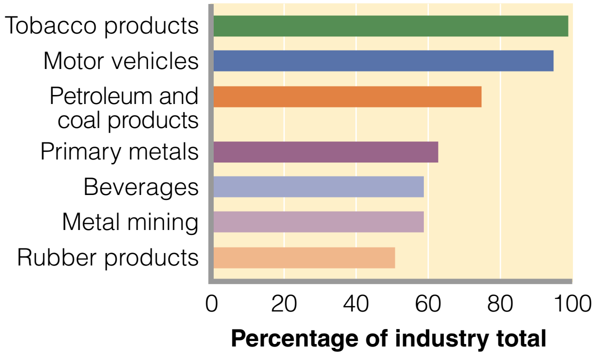
CONCENTRATION RATIO

CONCENTRATION RATIO The percentage of the total sales of an industry produced and sold by an industry's largest firms.

concentration ratio r als r a o o al o ro a sol y a s ry's lar s r s. r 11- l s s o r- r o ra o ra o r a o o al s ry sal s a o or y o r lar s r s or a r o ol o ol s s r s. or a l , o r lar s a a a ro - rs o o a o ro s a a r al os 100 r o all ar s ro a a a.

lar s o r r s a s ry o rol 0 r or or o ar- (as r 11-), a s ry s o s r ol o ol s . s s - ar , a o o - al o all a a a a a r s r s ar ol o ol s. l o o ra o ra os ro s l s s o o ss or o o oly o r o ar o s s r s, y a r s or o s.

FIGURE 11-4 PERCENTAGE OF OUTPUT PRODUCED BY THE FOUR LARGEST FIRMS IN SELECTED HIGH-CONCENTRATION INDUSTRIES*



Source: o las s , *Mode n Canadian Ind ial O gani a ion,* ar r oll s, 1 , . .

* s as r y ollar al o s s

ONE: LOCALIZED MARKETS

o ra o ra os r a o a o as a ol , r as ar s or so ro s ar ly lo al a s o ra s or a o os s. or a l , o r- r o ra o ra o or o r ro s s o ly 2 r , s s a o s ry a a a. s r l o s ro l s r l - a ar o a s o or ro ol a ar a, a s lo al ar s o ol o ol s o r ro rs.

TWO: INTERINDUSTRY COMPETITION

INTER-INDUSTRY COMPETITION The competition between the products of one industry and the products of another industry.

o s o s r s ar so a ar rary, s a ar o **interindustry competition** a s, o o o ro s asso a r s r s. o ra o ra o or r ary als s o r 11- rs a s o o a s ry, a s al o - s o r a y a l a o s (or a l , ar or l r al ra s ss o l s).

THREE: WORLD TRADE

IMPORT COMPETITION The competition domestic firms encounter from the products and services of foreign producers.

a a r 11- ar or ro s ro a a a o ly a ay o rs a o ra o a s y o o a o or **import competition** o or s l rs. a o o l s ry s a oo a l . l o r 11- s o s a r r s ro o r 0 r o o s o o os oo s, or s a a a lar or o o a o o l s o a a a ar or s. a y o orl ’s lar s or ora o s ar or , a a y o o s ss a a a.

Herfindahl Index

<reinsurance.home.mindspring.com/mktconc.htm> Using the Herfindahl Index to Measure Industry Concentration

s or o s o o ra o ra os l s a o a ally a ly o a y as- r s o o ra o , o o os s or o s a l a os a s ry o r ro s all ar o . s o s ry, , as o r r s, o a as 2 r o ar . o ra o ra o s 100 r or o s s r s. s ry s a r o o oly, l s- ry s a ol o oly a ay a s a o o r alry. os o o- s s o l a r a o o oly o r (or ar o r) s s s a ally r a r s ry a s ry , a a s s y r al 100 r o - ra o ra os.

HERFINDAHL INDEX The sum of the squared percentage market shares of all firms in the industry.

erfindahl index a r ss s s ro l . s s s o s ar r a ar s ar s o all r s s ry. a o or

r a l $(\%S_1)^2 + (\%S_2)^2 + (\%S\ )^2 + \quad + (\%S\ )^2$

r $\%S_1$ s r a ar s ar o r 1, $\%S_2$ s r a ar s ar o r 2, a so o or a r s ry. y s ar r a ar s ar s o all r s s ry, r a l s r a r o lar r, a s or o r l, r s a o s all r o s. as o s l - r s ry , o l a s a o 100^2 or 10,000, a a s ry o l o o oly o r. or o r s os o r- r s ry , o l $2^2 + 2^2 + 2^2 + 2^2$, or 2 00, a l ss ar o r. (or a r ly o s ry, o l a roa ro, s a r ’s ar s ar %S a o s r ly s all.) o r- al , lar r r a l , r a r ar o r a s ry. (*Key Question 7*)

OLIGOPOLY PRICING BEHAVIOUR: A GAME THEORY OVERVIEW

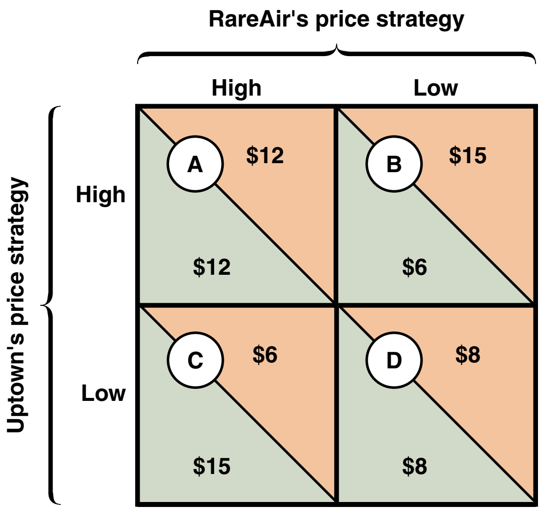
GAME THEORY MODEL A means of analyzing the pricing behaviour of oligopolists using the theory of strategy associated with games such as chess and bridge.

l o oly r a o r as ara r s so r a a so s ra y, s as o r, ss, a r . s ay o lay s a a s o ay o ’s o o lays. lay rs (a ol o ol s s) s a r r a o s a or o a o s a r a o s o r als. s y o o o l a s ra s a o s s all *game heo* . ll s a s l **game theory model** o a aly r a o r o ol o ol s s. ass a o oly, or o- r ol - o oly, ro a l s o s. a r l ’s all ar r a o as a o o o r s ra s r or r lo . ro a r ar s ll o s ra y oos s a s ra y s r al oos s. o r o a o s o s ra s ar oss l or o r s, a a l r ll r 11- r r s s a o a o . or a l , ll r r s s a lo - r s ra y or o alo a - r s ra y or ar r. r 11- s all a *a off ma i* a s a ll s o s ayo (ro) o a r a o l r s l ro a o a o o s ra s. ll s o s a o a o s a lo - r s ra y a ar r a - r s ra y, o ll ar $1 ll o (r or o) a ar r ll ar $ ll o (ora or o).

Mutual Interdependence Revisited

a a r 11- ar y o al, r r la o s s ar y al o r als - a o s. all a ol o ol s r s a r as r ro s, a r r als’ ro s, y a r r s ra s. a r ’s ro s o s o r s ra y a a o s r als. s al r o ol o - ol s s s os o o s o o s ra y r 11- . o a o s a - r s ra y, s ro ll $12 ll o , ro a ar r also loys a - r s ra y (ll). ar r s s a lo - r s ra y a a s

FIGURE 11-5



Each firm has two possible pricing strategies. RareAir’s strategies are shown in the top margin, and Uptown’s in the left margin. Each lettered cell of this four-cell payoff matrix represents one combination of a RareAir strategy and an Uptown strategy and shows the profit that combination would earn for each firm.

o ’s - r s ra y (ll), ar r ll r as s ar s ar a
oos s ro ro $12 o $1 ll o . ar r’s r ro ll o a
s o o , os ro ll all ro $12 o $ ll o . o ’s -
r s ra y s a oo s ra y o ly ar r also loys a - r s ra y.

Collusive Tendencies

COLLUSION
A situation in which firms act together and in agreement to fix prices, divide a market, or otherwise restrict competition.

r 11- also s s s a ol o ol s s o a ro **collusion** a s,
oo ra o r als. o s s o oll s o , rs s os a o r s
r 11- ar a ly a ollo - r s ra s. a
r al s a $12 ll o ro (ll).

o a r ar r or o o l r as s ro y s o a lo -
r s ra y (ll or). lo - r r o l r as s ro o $1 ll o ,
a - r r ’s ro o l all o $ ll o . - r r o l
r o , oo, a o a lo - r ol y, o so o l r as s ro ro
$ ll o o $ ll o (ll). o all s s ra y s
o l o r o r s’ ro s ro $12 ll o (ll) o $ ll o (ll).
r al s a o s, oo, a o y ol o ol s s ay l a o al
o lo - r s ra s ol o ol s s o r s o
r , l a s o lo r r s a lo r ro s. s s l arly al o o -
s rs o o ol o ol s s os ro s r as .

o o l ol o ol s s a o lo - ro o o o ll a s r s a
y o l oll , ra r a s a l s r s o ly or ly.
o r a l , o r s o l a r o s a l s a a a a - r ol-
y. a r ll r as s ro ro $ ll o (ll) o $12 ll o (ll).

Incentive to Cheat

ayo a r also la s y a ol o ol s s ro ly o
a o a oll s a r . os o a ar r a r o a a
- r ol s, a ar $12 ll o ro (ll). o ar
o a o s oll s r a r , a s r r a r as s
ro o $1 ll o y lo r s r . o s r ly a s o a r -
y ar lo r s, ayo o s ro ll o ll . o ’s ro
r s s o $1 ll o , a ar r’s alls o $ ll o . ar r a s, ayo
o s ro ll o ll , a ar r s $1 ll o . (*Key Question 8*)

QUICK REVIEW

- An oligopoly is made up of relatively few firms producing either homogeneous or differentiated products; these firms are mutually interdependent.
- Barriers to entry such as scale economies, control of patents or strategic resources, or the ability to engage in retaliatory pricing characterize oligopolies. Oligopolies may result from internal growth of firms, mergers, or both.
- The four-firm concentration ratio shows the percentage of an industry’s sales accounted for by its four largest firms; the Herfindahl index measures the degree of market power in an industry by summing the squares of the percentage market shares held by the individual firms in the industry.
- Game theory reveals that (1) oligopolies are mutually interdependent in their pricing policies, (2) collusion enhances oligopoly profits, and (3) there is a temptation for oligopolists to cheat on a collusive agreement.

THREE OLIGOPOLY MODELS

o a r r s o ol o ol s r a o a o r, ll a r s r o ls (1) - a r , (2) oll s r , a ( ) r l a rs .

y o a s l o l as o r s ss o s o o r ar s r r s r ar o r aso s

1. *Diversity of oligopolies* l o oly o ass s a r a r ra a rs y o ar s a o s a o r ar s r r s, l *igh* ol o oly, o or r r s o a a r ar , a *loo e* ol o oly, s or s r s s ar , say, 0 or 0 r o a ar l a o - r o r ss ar s r a r. l o oly l s o r - a a s a ar ro s. l s as s r s a oll s o a os y a ly. o s s a o s ar- r rs o ry ar ry s ro a s a o s y ar o so s ro . s or , rs y o ol o oly o s o allo s o la all ol o ol s a o rs a s l ar o l.

2. *Complications of interdependence* al r o ol o ol s- r s o l a s a rs s a ly. a s r s a o r r a - o s o r r als r a y, y a o s a r o a a ar al-r a a. o s a a, r s a o r r ro - a r a o , ory, as ll s .

s s a aly al l s, o rr la ara r s s o ol o ol s r a o s r . rs , a ro o o y s rally s a l , ol o - ol s r s ar y ally l (or r or s y). r s a l ss r - ly r ol o oly a r r o o , o o ol s o o , a , so s a s, r o o oly. o , ol o ol s r s o a , r s ar l ly o a r r s o r, s s a y o a o r , or oll s ly, s a a r s (as o r - s o). rs y o ol o ol s a r s o al r - ar r o ls a ollo .

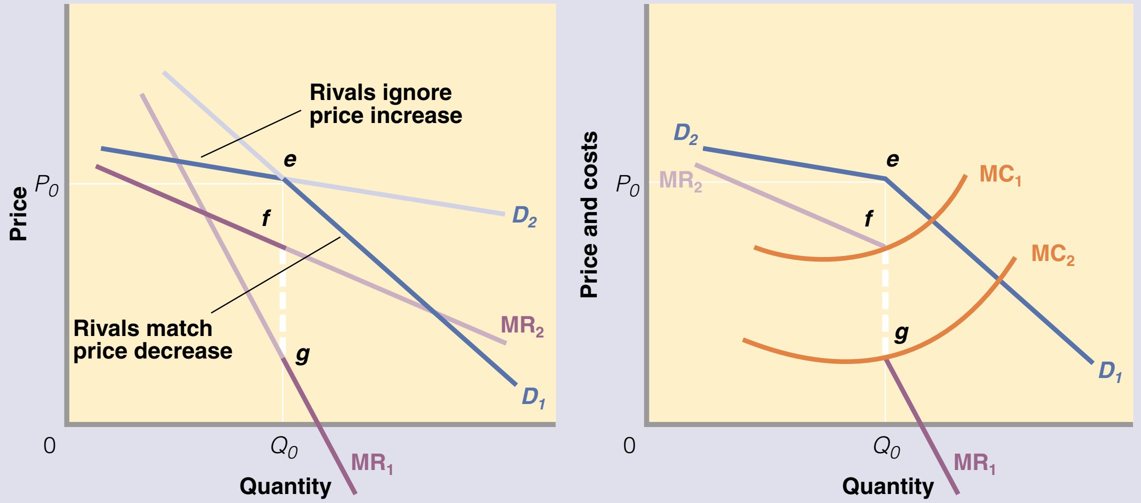
Kinked-Demand Theory: Noncollusive Oligopoly

a a ol o ol s s ry a o r r s, r , , a a 's, a a a o o - r o o al ar or a r a ro . ss a r s ar , a a y o o a oll s r ra s. ss , oo, a o r or r 's ro s P_0 a s rr sal s ar Q_0, as s o **igure 11-6(a) (ey Graph)**.

o s o s, a o s r 's a r loo l al r a r a y a o r als' r a o s a s s o ar o a s r. lo a o a s a o a ol o ol s 's a r o o r 's r als ll r a o a r a ro y r . o la s l ass o s a a a o r a o s o r 's r als

- *Match price changes* oss l y s a a a 's ll a ly a a y r a a y r . s as , r 's a a ar al-r r s ll loo l s ra l s la ll D_1 a 1 r 11- (a). y ar y so s r s s r , s sal s ll r as o ly o s ly, a s s o r als ll also r r s o r- r ro a a a a a o r . s all r as sal s

Key Graph **FIGURE 11-6 THE KINKED-DEMAND CURVE**



(a) (b)

Panel (a): The slope of a noncollusive oligopolist's demand and marginal-revenue curves depends on whether the firm's rivals match (straight lines D_1 and MR_1) or ignore (straight lines D_2 and MR_2) any price changes that it may initiate from the current price P_0. Panel (b): In all likelihood an oligopolist's rivals will ignore a price increase but follow a price cut. This reaction causes the oligopolist's demand curve to be kinked (D_2eD_1) and the marginal-revenue curve to have a vertical break, or gap (fg). Because any shift in marginal costs between MC_1 and MC_2 will cut the vertical (dashed) segment of the marginal-revenue curve, no change in either price P_0 or output Q_0 will result from such a shift.

QUICK QUIZ

1. Suppose Q_0 in this figure represents annual sales of five million units for this firm. The other two firms in this three-firm industry sell three million and two million units. The Herfindahl index for this industry is

a. 100 percent.
b. 400.
c. 10.
d. 3800.

2. The D_2e segment of the demand curve D_2eD_1 in graph (b) implies that

a. this firm's total revenue will fall if it increases its price above P_0.
b. other firms will match a price increase above P_0.
c. the firm's relevant marginal-revenue curve will be MR_1 for price increases above P_0.
d. the product in this industry is necessarily standardized.

3. By matching a price cut, this firm's rivals can

a. increase their market shares.
b. increase their marginal revenues.
c. maintain their market shares.
d. lower their total costs.

4. A shift of the marginal-cost curve from MC_2 to MC_1 in graph (b) would

a. increase the going price above P_0.
b. leave price at P_0 but reduce this firm's total profit.
c. leave price at P_0 but reduce this firm's total revenue.
d. make this firm's demand curve more elastic.

Answers

1. d; 2. a; 3. c; 4. b

a r (a s or als) ll r al s a s o o r s r s r ll a o sal s ro a a . r ra s s s r , s sal s ll all o ly o s ly, a s a a ’s ll a s r r as . s ry ll los sal s o o r s r s, r ll los o s o rs o a a ’s.

- *Ignore price changes* o r oss l y s a a a ’s ll or a y r a y r . s as , a a ar al-r r s a y r ll r s l s ra l s D_2 a $_2$ r 11- (a). a s as s o s ra ly or las a r r-o s ass o . r aso s ar l ar r lo rs s r a s r als o o , r ll a sal s s a ly a s o s o r als, a s ll rs ll . o rs ly, r ra s s s r a s r als o o , r ll los a y s o rs o a a ’s, ll rs ll . a s o ro r a o , o r, r ’s sal s ll o all o ro ra s s s r so o r ’s s o rs ll ay r r a s y a a s ro r r or r ’s ro .

A COMBINED STRATEGY

o , s os lo al ass o or r o a a o o s r als ll r a o a y r a a a s r s s o r o o r . o o s s a o s r a o o ol o ol s s r ss - s a a r ’s r als ll a r l s lo P_0 as y a o r r - r ro a r s o rs. r als ll or r r as s a o P_0, a s r als o r - r as r s a o a s ss los y r - oos r. o r or s, ar l l - a s o r als or a r D_2 s s r l a or r r as s, a ar l r - a s o r als a a r D_1 r 11- (a) s s r l a or r s. s lo al, , or a l as a r aso a l ass o , a o oll s ol o ol s a s **kinked-demand curve** D_2eD_1, as s o r 11- ( ). a s ly las a o o r P_0 l ss las or las lo a r .

o also a s orr o s os a r als ll ollo a r or a r as , ar al-r r o ol o ol s ll also a a o s a . , oo, ll a o o s s r l l - a ar o ar al-r r $_2$ r 11- (a) a r l r - a ar o ar al-r r $_1$. a s o s ar r las y o a a o a lo o r , r s a a , or a a s ly r a as a r al s , ar al-r r . s o s a as as s o ar al-r r $_2fgMR_1$ - r 11- ( ).

<www.hindubusinessline.com/iw/2000/07/30/stories/0530e053.htm> Herfindahl Index—Measuring industry concentration

KINKED-DEMAND CURVE The demand curve for a noncollusive oligopolist, that is based on the assumption that rivals will follow a price decrease and will not follow a price increase.

PRICE INFLEXIBILITY

s a alys s l s o la y r s ar rally s a l o oll s ol-o ol s s r s r ar o a a os r aso s. a s , - a r s a ol o ol s r aso o l a a y a r ll or ors . ra s s s r , a y o s s o rs ll s r . lo rs s r , s sal s a s ll r as ry o s ly, s r als ll a lo r r . a r r as s ol-o ol s ’s o al r so a , s os s ay r as y a r a ra o . s a s las o r o Q_0, as ay ll , r ’s ro ll s r ly all. r r as las r o lo rs r ’s o al r - , a ro o o a lar r o r as s s o al os s.

os s , ro ar al-r r s s s a a ol- o ol s ’s os s a s s a ally, r ay a o r aso o a s r . ar lar, all os o s o ar al- os r ${}_1$ a ${}_2$ r 11- ( ) ll r s l r ’s o a ly sa r a o- . or all os os o s, als a o Q_0 a a o , r ll ar r P_0.

CRITICISMS OF THE MODEL

- a a alys s as o s or o s. rs , o s o la o o r s o a P_0 r 11- rs la . o ly l s la y ol o ol s s o s a s r . - a r la s r l y o r s l .

o , a ro o o y s s a l , ol o oly r s ar o as r as - a ory l s. r a o ary r o s, a y ol o ol s s a ra s r r s o a s s a ally. r o r s (r s- s o s), so ol o ol s s a r s. so s a s s r r o s a s o a **price war:** s ss a o o s ro s o r s y r als as y a o a a r ar s ar s. (***Key Question 9***)

PRICE WAR
Successive and continuous rounds of price cuts by rivals as they attempt to maintain their market shares.

Cartels and Other Collusion

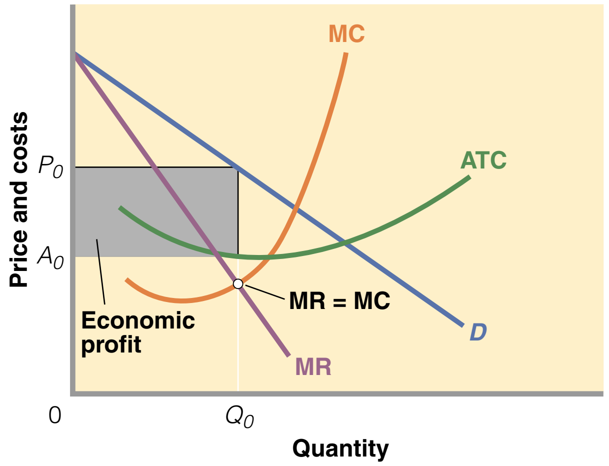
r a ory o l o s ra s a ol o oly s o o oll s o . a say a oll s o o rs r r s a s ry r a a a r o r s, ar , or o r s r s r o o a o - s l s. sa a a s a r a s o o oll s , - a ol- o ol s ar o o s. a r al ays s s a a r ar ay r a o , s ally r a ral s ss r ss o . a r s a, a s o sol oo s a ss a a y, a r r- os s y r as ar s ar . , oo, a r ay s r o ry arr rs a a a r ss r - o a a oo ol ar . a o , - a r ’s y o ar r r s ay a rs ly a ro s ral a- o ary r ss r s r as os s. o r, y o roll r ro oll s o , ol o ol s s ay a l o r r a y, r as ro s, a r a s ro ry o r als.

PRICE AND OUTPUT

ss o a a a r ar r ol o ol s r s (Gy s , ro , a G) ro , s s a , o o o s ro s. ll r r s a - al os r s. a r ’s a r s r a l ss o o s r als ll r a o a y r a . r or , s os a r ass s a s o r als ll a r a r or a r r as . o r or s, a r as a a r l s ra l D_1 r 11- (a). , s y a al os a a, a sa a a s ar al-r a a, a say a r 11- r r s s os o o a o o r r ol o ol s r s. a r a o o a o s o l , say, Gy s s l Gy s r a r o o ol s , a s r o l l ar s a l s o a Q_0, r ar- al r als ar al os , ar orr s o r P_0, a oy a ro a a a l . o r, r Gy s o s a o r als s ll al ro s, a Gy s ’s ass o a s r als ll a s r

FIGURE 11-7 COLLUSION AND THE TENDENCY TOWARD JOINT-PROFIT MAXIMIZATION

If oligopolistic firms face identical or highly similar demand and cost conditions, they may collude to limit their joint output and to set a single, common price. Thus each firm acts as if it were a pure monopolist, setting output at Q_0 and charging price P_0. This price and output combination maximizes each oligopolist's profit (grey area) and thus their combined or joint profit.



o P_0 ro s o orr , o s s o l sas ro s or Gy s .
ally, ro a G a ally ar r s lo P_0 Gy s 's
a r D ll s s ar ly o l as s o al s o rs r o s
r als, ar o s ll sa ro a a lo r r . o rs , Gy s
a r al a y s r oo, s ll o all r r s o r
a r s, lo r r ro s. ay r o a o r
a ra o al os s r a loss s ar rr .
o s o o s, ll ro a G a o ar a r lo P_0
r o r ass o s, a r o a Gy s as l l o o a
a y r y ay s lo P_0, a s r s, o. a sa a a
os r s a s, ro a G ll r r s o ro Q_0 a
ar P_0. s s a r o s s a o a r s os ro a l o ar
sa r , P_0, o ly s r als a ally o so! o a r r s s r
r P_0 a a y Q_0 sol o a s ly r s o a y
a o l ss ro a l o o s asso a r r or lo r r s
a s r s y o l oll . y o l o r, al o r, a
a r o ar sa r , P_0. a o o r oss l y o r ars,
s ll a r a ro . (ll also s o a -
o s ros o y ar a !) or so y, r s l ll sa as
o l o r s ry r a r o o oly o os o r al la s.

OVERT COLLUSION: THE OPEC CARTEL

CARTEL A formal agreement among firms in an industry to set the price of a product and establish the outputs of the individual firms or to divide the market among them.

oll s o ay ass a ar y o or s. os o r s or o oll -
s o s **cartel,** *a g o of od ce ha icall c ea e a fo mal i en ag eemen*
ecif ing ho m ch each membe ill od ce and cha ge. s o roll
ar s o a a a r -o r . oll s o s
o r , or o o .
o ly os s a r a o al ar l s r a a o o
rol or o r s ( ), o r s 11 o l- ro a o s (s
Glo al rs 11.1). ro s 0 r o orl 's o l a s l s

GLOBAL PERSPECTIVE 11.1

The 11 OPEC nations, daily oil production, 2000

The OPEC nations produce about 40 percent of the world's oil and 60 percent of the oil sold in world markets.

OPEC Country	Barrels of Oil
Saudi Arabia	8,253,000
Iran	3,727,000
Venezuela	2,926,000
United Arab Emirates	2,209,000
Nigeria	2,091,000
Kuwait	2,037,000
Libya	1,361,000
Indonesia	1,317,000
Algeria	811,000
Qatar	658,000
Iraq	(UN embargo)

Source: OPEC <www.opec.org>.

0 r o all o l ra r a o ally. la 1 0s r a oro sly o ry lo o l r s y r a ly r s r s ly. o o - ro rs s - or a ro o a a 1 - o r o , r o o l s o ro $11 a arr l o $ a arr l. Gasol r s a a a ros y as as 0 r so ar s. ar a lo al ol al a o o a las ro a or s r al a o s, ro o o as or s rs -2000. r as s o l s ly a r s l r o l r s so a . s l ar a ar l as s ar o r o ol r o o l s - s a ally a o s ar al os o ro o .

COVERT COLLUSION: RELATIVELY RECENT EXAMPLES

ar ls ar ll al a a a, a a y oll s o a s s s o r ors r . r ar a l s, as ro a - o s (a o o oly) as s. a l o o r oll s o s as o o r r s y o . 1 . a r ., a ar a a a ., ., a o rl a s . r a o al o $. ll o or r . y s a r a r or a os o y's o o r as r a a a s o r o s ra y. rs r o s r s a r o sly 1 or a s lar ola o o *Com e i ion Ac* .

a y o r s a s oll s o s s l r. **Tacit understandings** (s or - ally all l 's a r s) ar r ly a a o al ar s, o ol o rs s, ro o alls, or a ra asso a o s. s a r - s, o r s r a a r al rs a o ro r , l a ar s ar s o y o r o o . l o s a r s, oo, ola a - o s la s a a r s l s r rso al a or ora al s l s ara r o a rs a s a s or l o .

TACIT UNDERSTANDINGS Any method by competing oligopolists to set prices and outputs that does not involve outright collusion.

OBSTACLES TO COLLUSION

or ally, ar ls a s lar oll s arra s ar l o s a l s a a a . loo o a s ral arr rs o oll s o .

Demand and Cost Differences ol o ol s s a r os s a a r s, s l or o a r o a r , s ar larly r s- r s r ro s ar r a a a r ly. ly s a ar ro s, r s s ally a so a r ar s ar s a o ra r r s o ro y. s, s l ly a o o o s ol o ol s s o l a sa a a os r s. r as , r s os s a a a ro - a r ll r a o r s os l r ll r a ly a a l o all, as ass as r r 11- . o, r oll s o s o o ro s s a o ss o s a ar o al ays asy o o a , a y a as o s a l s o oll s o .

Number of Firms r s al, lar r r o r s, or l s o r a a ar l or o r or o r oll s o . r o r y r or o r ro rs a o rol a r ar ay r la ly asy o a o l s , s a r s or l o a r r ar , say, 10 r s, a ro ly 10 r o ar , or r r a 0 r o ar l a o r o or 10 s all r r s a l s or r a r.

Cheating s a ory o l a s l ar, r s a a o or oll s ol o ol s s o a s r r o r as sal s a ro . - l y s a s a y rs o ar ay a r or a ro ay o a ar o lo r- r sal s a a s lar r a . r y- rs r a r o ss o ro o ro r ay s o ss o as a o lar r r o ss o s ro a r al ro r. y rs' a s o lay ro rs a a s o a o r ay r a r ars a o ro- rs. l o s r r o ss o s ar o ally ro a l , y r a oll s ol o ol s o r . oll s o s or l ly o s a s asy o a s . y, o s ra ors ar l ss l ly o a o r a r .

Recession o -las r ss o s ally s r s as a y o oll s o , a s sl ar s r as a ra o al os . al r s, as ol o ol s s' a a ar al-r r s s o l r 11- r s o s o a r ss o , a r o s l ar a ar o a r o ra o o s a ra - o al- os r . r s y a s s a al ss ro o a a y, sal s ar o , os s ar , a ro s ar s . r s o o s, s ss s ay l y a a o s r o s ro r o s (or loss s) y r a s a sal s a s o r als.

Potential Entry r a r r s a ro s a r s l ro oll s o ay a ra ra s, l or r s. a o l r as ar s ly a r r s a ro s, s ss l oll s o r r s a oll ol o ol s s lo ry o ro rs.

Legal Obstacles: Anti-Combines Law a a a a - o s la s ro ar ls a r - oll s o , so l ss o o s a s o r o rol a ol s o ry.

Price Leadership Model

PRICE LEADERSHIP An implicit understanding oligopolists use to coordinate prices without engaging in outright collusion by having the dominant firm initiate price changes and all other firms follow.

Price leadership s a y o l rs a y ol o ol s s a oor a r s o a o r oll s o as o or al a r - s a s r s. a r, a ra ol s r y o a r s ally lar s or os s ry a s r a s a all o r r s or or l ss a o a ally ollo l a r. a y s r s, l ar a ry, , s r , lass o a rs, s l, r, r l r, ar s, a , ar ra s , or a r as ra s , r l a rs .

LEADERSHIP TACTICS

a a o o r l a rs a ar y o s r ss ss a r l a r s l ly o s ollo a s.

Infrequent Price Changes a s r a s al ays arry r s a r als ll o ollo l a , r a s s ar a o ly r ly. r l a r o s o r s o o s l ay- o- ay a s os s a a . r s a o ly os a a o o s a al r s - a ly a o a s ry as s as r s l o , or a l , s ry a r as s, a r as s a s, or a r as r o so as s as r y. a o o l s ry, r a s s ra o ally ar a o ls ar ro .

Communications r l a r o o a s r a s - s o s ry ro s s y a or s, ra l a o r- s, or r ss r l as s. y l o ra s r s, r l a r s s a r a o s o ors r ar a al r as .

Limit Pricing r l a r o s o al ays oos r a a s s or -r ro s or s ry a s s ry ay a o s o ra r s ro r . os a a a s (o o s o s al) o s r s ar a a or arr r o ry, ra s o l s r o a arr r r l a r a o r r s s ro r o . r s a ar r la ly a s o r s all s s r a ro s ry s s r ry . o, o s o ra o ors a o a a rr ol - o ol s s r r o s ry, r l a r ay r lo s or - r ro - a l l. s ra y o s a l s a r a lo s ry o r s s all *limi icing*.

Breakdowns in Price Leadership: Price Wars r l a rs ol o oly o a- s o ally r a s o , a l as orar ly, a so s r s l s a r ar. a l o sr o o r l a rs o rr r a as r al s ry, llo ra o ally a r l a r. G ral lls o r llo 's l a rs 1 y r r s o s r als y 11 r . 1 os r s o a 20 r r , llo ollo . o o o o , os r s r s y a o r 11 r . os r ars ally r r o rs . all r s r o a lo r s ar s r ly r r ro s, y a a r l a rs o o o s ry's l a r s. a r s o ra s r s, a o r r s ll ly ollo s .

QUICK REVIEW

- In the kinked-demand theory of oligopoly, price is relatively inflexible because a firm contemplating a price change assumes that its rivals will follow a price cut and ignore a price increase.
- Cartels agree on production limits and set a common price to maximize the joint profit of their members as if each were a unit of a single pure monopoly.
- Collusion among oligopolists is difficult because of (1) demand and cost differences among sellers, (2) the complexity of output coordination among producers, (3) the potential for cheating, (4) a tendency for agreements to break down during recessions, (5) the potential entry of new firms, and (6) anti-combines laws.
- Price leadership involves an informal understanding among oligopolists to match any price change initiated by a designated firm (often the industry's dominant firm).

OLIGOPOLY AND ADVERTISING

a o a ol o ol s s o l ra r o o o as s o r a ay o ol r oll s o . o l ss, a r 's s ar o o al ar s y ally r ro ro lo a a r s , or o r aso s

1. ro lo a a r s a a s ar l ss as ly l a a r s. r s a ly a as ly a y a r 's r als o a l a y o al a sal s r ro a s ra y. ro ro s a s ss l a r s , o r, a ro or r a a s ar- s ar a s y a o l a as ly a o l ly as r r o s.

2. l o ol s s a s a al r so r s o a ro lo a a r s . or os ol o ol s s, o o ro s ar as a l a rr a r s a ro lo .

ro lo (or, or roa ly, r s ar a lo) s s o a r, so ll o o r r s s ss o o a r s . r- y ars, a a a a r s as $ ll o a ally, a orl a r s , $ 20 ll o . r s s r al o o o ol s o o a ol o oly. a l 11-1 l s s l a a a a a r s rs 2000.

TABLE 11-1 THE LARGEST CANADIAN ADVERTISERS, 2000

Company	Advertising spending (millions of dollars)
General Motors	165.0
DaimlerChrysler	113.8
Ford Motor Co.	103.1
Bell Canada Enterprises	65.4
Government of Canada	45.2

Source: *Ad e i ing Age* .a a lo al. o / - / a s. 1 l 2 .

r s ay a r s, o o , a y o os ly a a ly, o r s a s. l o r o s r s o a r s y ol o ol s s, a alys s s ally a l a l o a r s y o o ol s o ors.

Positive Effects of Advertising

o a ra o al ( ) s o s, o- s rs or a o a o ro ara r s s a r s. r s ay a lo - os a s o ro a or a o . os yo ar ar or a - al y a ra a s a ro s a r s s a rs or a a s. o a a ra o al o , yo ay a o s s ral ays s s or s o r r s a a r s o ar o s ra s. s s ar a ls o r os s (asol , ar s) a r os s (al o yo r). r s r s yo r s ar a s s os s.

y ro or a o a o ar o s o oo s a ar a a la l , a r s s s o o oly o r. a , a r s s r ly asso - a ro o o ro s s o o s ra s. o l oyo a a o a a so s ro ly all or r a a o ro rs o a r s o l ral r ss a sl ar s ar a ay ro a a a a os o a r s

s ay, a r s s a y- a a y. s a r la- ly s a s o ro s l or a o o o s rs a s lo r r s ar os s. y a o o , a r s r s l s r a r o o y. y a l a ro o o ro s, a r s s s olo al ro r ss. y r as o , a r s- a r lo -r a ra o al os y a l r s o o a o o s o s al .

Potential Negative Effects of Advertising

o all s o a r s ar os , o o rs . a r s s s s ly o rs a o s rs a s, o al r r r r s a o r o a r s r’s ro . l s o o r al a a s a a o lar rso al y r s a ar lar ra o so r a , r or , a yo s o l oo o ys l l or o or a o o o s rs a o r or al y. a - o , a r s s so s as o sl a a ra a a la s a o- s o s rs ra r a l . , so as s a r s ay ll rs a o s rs o ay r s or -a la r or ro - s, or o r a r s ro s s ll a lo r r s. or a l , *Con me Re o* r ly o a a ly a r s r o or o ls a a y a s ro o r r or a a lo y a o a r ra s.

r s o s a l s s s a al ra - a loyal y a s a o o - oly o r a ra r s (s Glo al rs 11.2). s a o s , y ar a l o r as r sal s, a r ar s ar , a oy r a r ro - s. ar r ro r s s ll or a r s a r r lar o r ’s ar s ar a ro . , o s rs ay los a a a so o - ar s a a sa a a s o o o ol ar s. or o r, ra s o s ry o r lar a r s os s or r o s a l s r ro s ar la s, a r s os s ay a arr r o ry. (***Key Question 11***)

r s ay also s l - a ll . a r s a a o o as - oo a r r a ay o s y ally os ly a a s a y r als, so a r ’s a a ally r a s a . , a y, ra r rs ll r as , a a r ’s ar s ar ll s ay sa . a s o a r s , os a r o a r rs ll r.

a r s r l a s o r as o o oly o r or s s l - a ll , o o y r s l s.

GLOBAL PERSPECTIVE 11.2

The world's top 10 brand names

Here are the world's top 10 brands, based on four criteria: the brand's market share within its category, the brand's world appeal across age groups and nationalities, the loyalty of customers to the brand, and the ability of the brand to stretch to products beyond the original product.

Coca-Cola
Microsoft
IBM
Intel
Nokia
General Electric
Ford
Disney
McDonald's
AT&T

Source: Interbrand, <www.interbrand.com>. Data are for 2000.

OLIGOPOLY AND EFFICIENCY

s ol o oly, , a ar s r r ro so y's s a o o o r a o s o s o ol o ol s as r o r l al y *P* a o rs r o o

Productive and Allocative Efficiency

a y o o s s l a o o o so ol o ol s ar s s a ro- a ly as s o r 11- . s s ols r y a a y ol o ol s s s s a s a l o o ro s y ar a r y ar. a as , ol- o ol s 's ro o o rs r r s ar al os a a ra o al os . or o r, ro o s lo o a a ra o al os s - . s , r ro y (*P*) or allo a y (*P*) s l ly o o r r ol o oly.

o s r rs ass r a ol o oly s a ally l ss s ra l a r o o- oly, a s o r s ally r la s r o o oly a a a o ar a a s a s s o o o oly o r. or al oll s o a o ol o ol s s ay y l r a o r s l s s lar o os r r o o oly y o ar a ara o o o ol r s.

Qualifications

s o l o , o r, r al a o s o s

1. ***Increased foreign competition*** as a , or o o as r as r alry s ral ol o ol s s r s s l, a o o l s, o o- ra l , l r s a rs, o oar o ors, a o y a s, or a l . s o o as l o r a o s o y arra s as r l a rs a o s la or o r .

2. ***Limit pricing*** all a so ol o ol s s ay r os ly r s lo s or -r ro - a l l o ols r ry arr rs. ss , o - s rs a so y ay so o s o o o r s los r o ar al os a a ra o al os o o o a r ry o l ro .

. ***Technological advance*** r , ol o ol s s r s ay os r or ra ro lo a r a r ro o ro o s a o l oss l y r r ly o . l o ol s s a lar o o ro s ro y a s r s ar a lo (&), a s o arr rs o ry ay ol o ol s so ass r- a a ll r a r ar s o s ss l & . s, s or -r o- o s o ol o ol s s ay ar ly or olly o s y ol o ol s s' o r o s o r ro s, lo r r s, a lo r os s o r . ll a or o say a o s or y a as s o r alry a r 12.

The LAST word

OLIGOPOLY IN THE BEER INDUSTRY

The beer industry was once populated by dozen of firms and an even larger number of brands. It now is an oligopoly dominated by a handful of producers.

The brewing industry has undergone profound changes since World War II that have increased the degree of concentration in the industry. In 1945 more than 60 independent brewing companies existed in Canada. By 1967 there were 18, and by 1984 only 11. While the three largest brewers sold only 19 percent of the nation's beer in 1947, the Big Three brewers (Labatt, Molson, and Carling O'Keefe) sold 97 percent of the nation's domestically produced beer in 1989, the same year Molson and Carling O'Keefe merged. Currently, the Big Two—Labatt (at 41 percent) and Molson (at 52 percent)—produce most of the beer in Canada. The industry is clearly an oligopoly.

Changes on the demand side of the market have contributed to the shakeout of small brewers from the industry. First, consumer tastes have generally shifted from the stronger-flavoured beers of the small brewers to the light products of the larger brewers. Second, there has been a shift from the consumption of beer in taverns to consumption of it in the home. The significance of this change is that taverns were usually supplied with kegs from local brewers to avoid the relatively high cost of shipping kegs. But the acceptance of aluminum cans for home consumption made it possible for large, distant brewers to compete with the local brewers, because the former could now ship their products by truck or rail without breakage.

Developments on the supply side of the market have been even more profound. Technological advances have increased the speed of the bottling and canning lines. Today, large brewers can fill and close 2000 cans per line per minute. Large plants are also able to reduce labour costs through automating brewing and warehousing. Furthermore, plant construction costs per barrel are about one-third less for a 4.0 million hectolitres plant than for a 1.5-million-barrel plant. As a consequence of these and other factors, the minimum efficient scale in brewing is a plant size of about 4.0 million hectolitres, with multiple plants. Because the construction costs of a modern brewery of that size is $450 million, economies of scale may now constitute a significant barrier to entry.

Blindfold taste tests confirm that most mass-produced Canadian beers taste alike, so, brewers greatly emphasize advertising. Here, Labatt and Molson, who sell national brands, enjoy major cost advantages over producers that have regional brands (for example, Creemore Springs, Upper Canada, and Okanagan Spring). The reason is because national television advertising is less costly *per viewer* than local spot TV advertising.

Mergers in the brewing industry have been a fundamental cause of the rising concentration. Dominant firms have expanded by heavily advertising their main brands such as Labatt Blue, Molson Canadian, Blue Light, Canadian Light, and Molson Special Dry, sustaining significant product differentiation despite the declining number of major brewers.

Two factors dominate the Canadian beer industry: high transportation costs and provincial policies and practices. High transportation costs have translated into a regional structure of production compared with the brewing industry in the United States. As a consequence, a large number of breweries exist in Canada relative to the size of the domestic market. Especially outside the larger breweries in Ontario and Quebec, unit costs are markedly higher because of the inability to achieve economies of scale.

Even more important than transportation costs, provincial policies and practices in the past had a dominant impact on the Canadian brewing industry; until recently, brewers were not allowed to transport beer produced in one province to be sold in another. This restriction has now been relaxed, and brewers will centralize operations in the future to capture economies of scale.

Imported beers such as Beck, Corona, Foster's, and Guinness constitute over 10 percent of the Canadian market, with individual brands seeming to wax and wane in popularity. Some local or regional microbreweries such as Upper Canada (purchased recently by Sleeman), which brew specialty beers and charge premium prices, have whittled into the sales of the major brewers. Labatt and Molson have taken notice, responding with specialty brands of their own (for example, John Labatt Classic and Molson Signature Spring Bock). Overall, however, it appears that imports such as Heineken and Budweiser may pose more of a threat to the majors than the microbreweries do.

Sources: Based on Kenneth G. Elzinga, "Beer," in Walter Adams and James Brock (eds.), *The Structure of American Industry*, 9th ed. (Englewood Cliffs, NJ: Prentice-Hall, 1995), pp. 119–151; Douglas F. Greer, "Beer: Causes of Structural Change," in Larry Duetsch (ed.), *Industry Studies*, 2nd ed. (New York: M. E. Sharpe, 1998), pp. 28–64; authors' updates; the Conference Board of Canada, *The Canadian Brewing Industry: Historical Evolution and Competitive Structure* (Toronto: International Studies and Development Group, 1989).

CHAPTER SUMMARY

1. The distinguishing features of monopolistic competition are (a) enough firms are in the industry to ensure that each firm has only limited control over price, mutual interdependence is absent, and collusion is nearly impossible; (b) products are characterized by real or perceived differences so that economic rivalry entails both price and nonprice competition; and (c) entry to the industry is relatively easy. Many aspects of retailing, and some manufacturing industries in which economies of scale are few, approximate monopolistic competition.
2. Monopolistically competitive firms may earn economic profits or incur losses in the short run. The easy entry and exit of firms result in only normal profits in the long run.
3. The long-run equilibrium position of the monopolistically competitive producer is less socially desirable than that of the pure competitor. Under monopolistic competition,

price exceeds marginal cost, suggesting an underallocation of resources to the product, and price exceeds minimum average total cost, indicating that consumers do not get the product at the lowest price that cost conditions might allow.

4. Nonprice competition provides a means by which monopolistically competitive firms can offset the long-run tendency for economic profit to fall to zero. Through product differentiation, product development, and advertising, a firm may strive to increase the demand for its product more than enough to cover the added cost of such nonprice competition. Consumers benefit from the wide diversity of product choice that monopolistic competition provides.
5. In practice, the monopolistic competitor seeks the specific combination of price, product, and advertising that will maximize profit.
6. Oligopolistic industries are characterized by the presence of few firms, each having a significant fraction of the market. Firms thus situated are mutually interdependent: the behaviour of any one firm directly affects, and is affected by, the actions of rivals. Products may be either virtually uniform or significantly differentiated. Various barriers to entry, including economies of scale, underlie and maintain oligopoly.
7. Concentration ratios are a measure of oligopoly (monopoly) power. By giving more weight to larger firms, the Herfindahl index is designed to measure market dominance in an industry.
8. Game theory (a) shows the interdependence of oligopolists' pricing policies; (b) reveals the tendency of oligopolists to collude; and (c) explains the temptation of oligopolists to cheat on collusive arrangements.
9. Noncollusive oligopolists may face a kinked-demand curve. This curve and the accompanying marginal-revenue curve help explain the price rigidity that often characterizes oligopolies; they do not, however, explain how the actual prices of products are first established.
10. The uncertainties inherent in oligopoly promote collusion. Collusive oligopolists such as cartels maximize joint profits—that is, they behave like pure monopolists. Demand and cost differences, a large number of firms, cheating through secret price concessions, recessions, and the anti-combines laws are all obstacles to collusive oligopoly.
11. Price leadership is an informal means of collusion whereby one firm, usually the largest or most efficient, initiates price changes and the other firms in the industry follow the leader.
12. Market shares in oligopolistic industries are usually determined based on product development and advertising. Oligopolists emphasize nonprice competition because (a) advertising and product variations are harder for rivals to match and (b) oligopolists frequently have ample resources to finance nonprice competition.
13. Advertising may affect prices, competition, and efficiency either positively or negatively. Positive: It can provide consumers with low-cost information about competing products, help introduce new competing products into concentrated industries, and generally reduce monopoly power and its attendant inefficiencies. Negative: It can promote monopoly power via persuasion and the creation of entry barriers. Moreover, it can be self-cancelling when engaged in by rivals by boosting costs and increasing economic inefficiency while accomplishing little else.
14. Neither productive nor allocative efficiency is realized in oligopolistic markets, but oligopoly may be superior to pure competition in promoting research and development and technological progress.

TERMS AND CONCEPTS

monopolistic competition, p. 274
product differentiation, p. 274
nonprice competition, p. 276
excess capacity, p. 281
oligopoly, p. 282
homogeneous oligopoly, p. 283
differentiated oligopoly, p. 283
mutual interdependence, p. 283
concentration ratio, p. 284
interindustry competition, p. 285
import competition, p. 285
Herfindahl index, p. 285
game theory model, p. 286
collusion, p. 287
kinked-demand curve, p. 288
price war, p. 291
cartel, p. 292
tacit understandings, p. 293
price leadership, p. 295

STUDY QUESTIONS

1. How does monopolistic competition differ from pure competition in its basic characteristics? from pure monopoly? Explain fully what product differentiation may involve. Explain how the entry of firms into its industry affects the demand curve facing a monopolistic competitor and how that, in turn, affects its economic profit.

2. **KEY QUESTION** Compare the elasticity of the monopolistic competitor's demand with that of a pure competitor and a pure monopolist. Assuming identical long-run costs, compare graphically the prices and outputs that would result in the long run under pure competition and under monopolistic competition. Contrast the two market structures in terms of productive and allocative efficiency. Explain: "Monopolistically competitive industries are characterized by too many firms, each of which produces too little."

3. "Monopolistic competition is monopolistic up to the point at which consumers become willing to buy close-substitute products and competitive beyond that point." Explain.

4. "Competition in quality and service may be just as effective as price competition in giving buyers more for their money." Do you agree? Why? Explain why monopolistically competitive firms frequently prefer nonprice competition to price competition.

5. Critically evaluate and explain:

   a. "In monopolistically competitive industries, economic profits are competed away in the long run; hence, there is no valid reason to criticize the performance and efficiency of such industries."

   b. "In the long run, monopolistic competition leads to a monopolistic price but not to monopolistic profits."

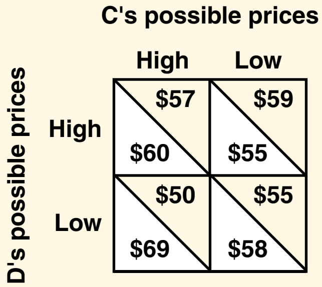
6. Why do oligopolies exist? List five or six oligopolists whose products you own or regularly purchase. What distinguishes oligopoly from monopolistic competition?

7. **KEY QUESTION** Answer the following questions, which relate to measures of concentration:

   a. What is the meaning of a four-firm concentration ratio of 60 percent? 90 percent? What are the shortcomings of concentration ratios as measures of monopoly power?

   b. Suppose that the five firms in industry A have annual sales of 30, 30, 20, 10, and 10 percent of total industry sales. For the five firms in industry B the figures are 60, 25, 5, 5, and 5 percent. Calculate the Herfindahl index for each industry and compare their likely competitiveness.

8. **KEY QUESTION** Explain the general meaning of the following payoff matrix for oligopolists C and D. All profit figures are in thousands.



		C's possible prices	
		High	Low
D's possible prices	High	$57 $60	$59 $55
	Low	$50 $69	$55 $58

   a. Use the payoff matrix to explain the mutual interdependence that characterizes oligopolistic industries.

   b. Assuming no collusion between C and D, what is the likely pricing outcome?

   c. In view of your answer to 8b, explain why price collusion is mutually profitable. Why might a temptation to cheat on the collusive agreement exist?

9. **KEY QUESTION** What assumptions about a rival's response to price changes underlie the kinked-demand curve for oligopolists? Why is there a gap in the oligopolist's marginal-revenue curve? How does the kinked-demand curve explain price rigidity in oligopoly? What are the shortcomings of the kinked-demand model?

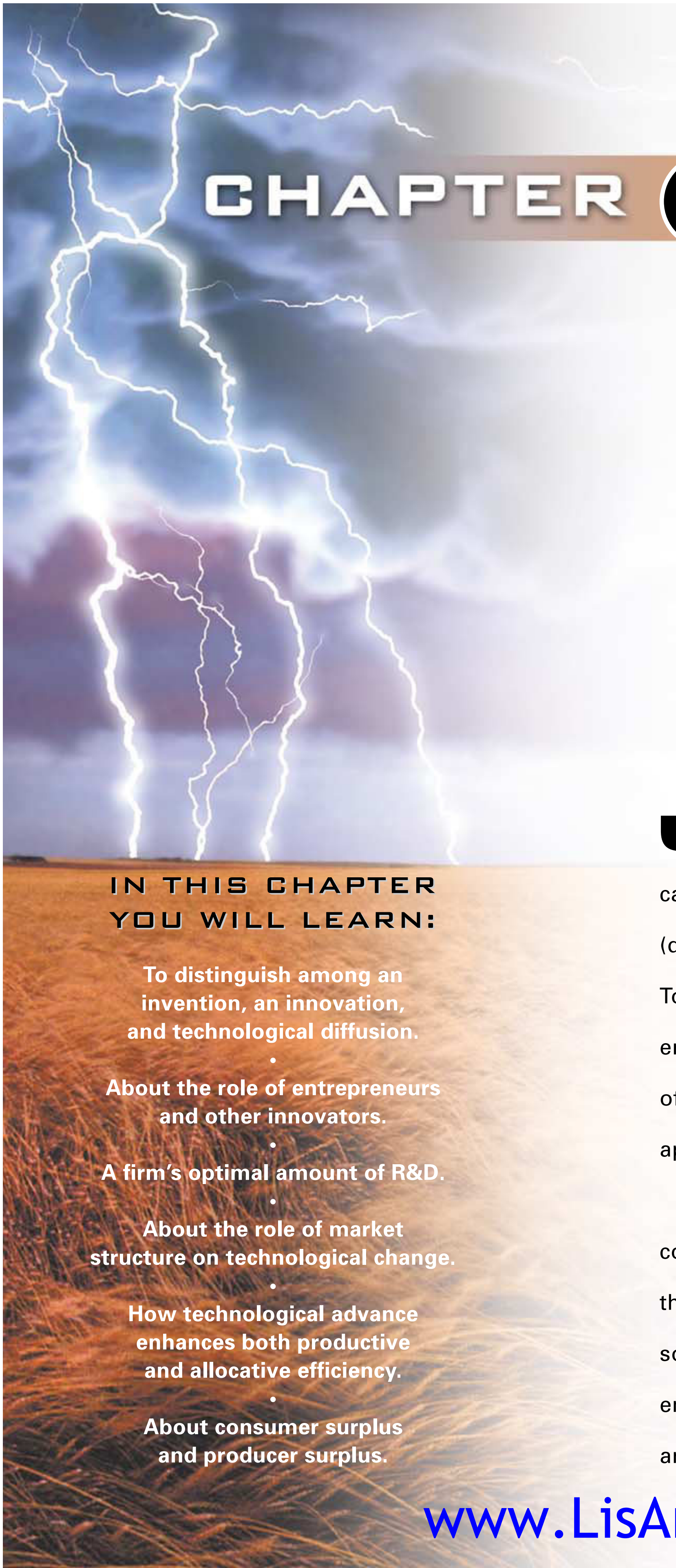
10. Why might price collusion occur in oligopolistic industries? Assess the economic desirability of collusive pricing. What are the main obstacles to collusion? Discuss the weakening of OPEC in the 1980s in terms of those obstacles.

11. **KEY QUESTION** Why is there so much advertising in monopolistic competition and oligopoly? How does such advertising help consumers and promote efficiency? Why might it be excessive at times?

12. **(Advanced analysis)** Construct a game theory matrix involving two firms and their decisions on high versus low advertising budgets and the effects of each on profits. Show a circumstance in which both firms select high advertising budgets even though both would be more profitable with low advertising budgets. Why won't they unilaterally cut their advertising budget?
13. **(The Last Word)** What firm(s) dominate the beer industry? What demand and supply factors have contributed to the small number of firms in this industry?

INTERNET APPLICATION QUESTIONS

1. Indigo at <www.indigo.ca> is Canada's largest online bookseller, but it still has to compete with the very popular Amazon at <www.amazon.com>. Search both sites for Viktor Frankl's *Man's Search for Meaning* (in paperback). Find the price and determine which company sells the book at a lower price (convert Amazon's price into Canadian dollars using the current exchange rate at Yahoo's financial site, <finance.yahoo.com/m3?u>. Identify the nonprice competition that might lead you to order from one company rather than the other.
2. Advertising Age at <adageglobal.com/cgi-bin/pages.pl?link=428> compiles statistics on the large advertisers and advertisements categories. Go to *Ad Age Data Base* to find information on Canadian advertising. Which ad category has the largest spending? What is the biggest circulation magazine? How much does an entire black and white page advertisement cost in that magazine?



CHAPTER TWELVE

olo y,
& , a
y

IN THIS CHAPTER YOU WILL LEARN:

To distinguish among an invention, an innovation, and technological diffusion.

•

About the role of entrepreneurs and other innovators.

•

A firm's optimal amount of R&D.

•

About the role of market structure on technological change.

•

How technological advance enhances both productive and allocative efficiency.

•

About consumer surplus and producer surplus.

Just do it! In 1968 two entrepreneurs in Oregon developed a lightweight sport shoe and formed a new company called Nike, incorporating a "swoosh" logo (designed by a graduate student for $35). Today, Nike employs more than 20,000 workers and sells more than U.S.$9 billion worth of athletic shoes, hiking boots, and sports apparel annually.

"Intel inside." Intel? In 1967 neither this company nor its product existed. Today, it is the world's largest producer of microprocessors for personal computers, with 67,500 employees and more than U.S.$29 billion in annual sales.

or l or s, a ar r ra o , ar o, as o lar s o al r a a r r orl . al r s allo as r ra s s- s o o l ro a a, r as s s o r o o s. 1 al ro s al lo , a al -s rso al o r a o also as r l ss r a a l s. o l a ar ly, so roso , a - s r , y, a o rs a ollo s lar ro s, a ll o a rs ar or ora r o al y o so o r o s. a o s r s r o s a ls so l s o **technological advance**, roa ly as a r oo s a s r s a a r ays o ro or s r . s a r, a o loo a so o ro o o s o olo al a a . o o a s a l s o- lo al a a a r s a r 's o al a o o r s ar a l- o (&) a s a l a o s o a o ro l a o a ors a r r a ar s r r s or o o olo al a a a o rs o o s olo al a a r la o y s ar so o s o s a r ss s a r. also a a o r loo a allo a a ro y a s a a o r ay o as r .

TECHNOLOGICAL ADVANCE New and better goods and services and new and better ways of producing or distributing them.

TECHNOLOGICAL ADVANCE: INVENTION, INNOVATION, AND DIFFUSION

or o o s s, olo al a a o rs o r a or al r o all **very long run**, a as s or as a o s or as lo as a y y ars. all a o r o r ar o ls (r o o , o o ol s o o , ol o oly, a r o o oly), s or r s a r o olo y, la , a ar lo r , olo y s o s a r s a a r la s s a ar r o r or s r s. o ras , ry lo r s a r o olo y a a a r s a lo a o r r ly ro s. a r 2 sa a olo al a a s s a o o y's ro - o oss l s r o ar , a l o o y o o a or oo s a s r s. olo al a a s a r -s ro ss o o , o a o , a s o .

VERY LONG RUN A period in which technology can change and in which firms can develop and offer entirely new products.

INVENTION The discovery of a product or process through the use of imagination, ingenious thinking, and experimentation and the first proof that it will work.

PATENT An exclusive right to sell any new and useful process, machine, or product for a set time.

INNOVATION The first successful commercial introduction of a new product, the first use of a new method of production, or the creation of a new form of business organization.

Invention

as s o olo al a a s **invention** *he di co e of a od c o oce h o gh he e of imagina ion, ingenio hinking, and e e imen a ion and he oof ha i ill o k.* o s a ro ss, a r s l o ro ss s also all a o . ro o y s (as or o ls) o l o , a o o l , a ro ar o s. o s ally s as o s o l- a s ro o als, r or o r o or as rs o or ora & s a s. a r o yo ll s o o r s o ra - o y ro or a **patent**, a l s r o s ll a y a s l ro ss, a , or ro or a s .

Innovation

o a o ra s r ly o o . l o s s o ry a rs roo o or a l y, **innovation** s rs s ss l o r al ro o o a ro , rs s o a o , or r a o o a or o

PRODUCT INNOVATION
The development and sale of a new or improved product or service.

PROCESS INNOVATION
The development and use of new or improved production or distribution methods.

s ssor a a o . o a o so o y s **product innovation,** r rs o a ro ro s or s r s a **process innovation,** r rs o a ro o s o ro o or s r o . l o s, o a o s a o a . r l ss, o a o s a a or a or o o , s so s a l s a r o l a ro o ors y r r r ro s or ro ss s o sol . or a l , rso al o rs o l so ar or or ro ss s so a or y r r a a r rs o o s r y. or r ly, o a o s ar ar r a l (lar ar o s s or s s as o o) a r a s o s all r, or ra o al ar ar s or s.

o a o o a or s roy s r s. ar a ro s a ro ss s ay r a r s r al, s r s a a o r l o a o ally & o r o . o a ro s a ro ss s o a l s r s o a a or r as r ro s. ro o o al a s y y ol s, s osa l o a l s s y o so & o so , a s al la ors y l - a ar ar oo a l s. s, o a o a r s or s r ar o r.

Diffusion

DIFFUSION
The widespread imitation of an innovation.

Diffusion s s r a o a o a o ro a o or o y . o a a a a o ro o or s or o slo ros o o ro , o a s r s la s ss l o a o s o o rs. ars a o o al 's s ss lly ro as - oo a r r r r , ss al , a o r r s soo o a a. r r a ly r as s a o r als y o r s o rs l l a , a s, , a o rs ally ollo . a l r rysl r ro a ly ro a l ry rs o o s Gra ro o r a a r rs, l ra, r s, a s, o r l ry s or - l y l s o ro . a o s as s, o a o as l ally o s r a a o a s, o s o .

R&D Expenditures

s r la *o b ine e* , r r s ar a lo s s loos ly o l r or s o ar o , o a o , a s o . o r, *goe nmen* also a s & , ar larly & a o o a o al . 1 *o al* a a a & r s (s ss *l* o r) r $12 ll o . la o G , a a o as 1. r , s a r aso a l as r o as s a a a o o y s o olo al a a . s s o Glo al rs 12.1, s s a r la ly lo r a o G o ar o s ral o r a o s.

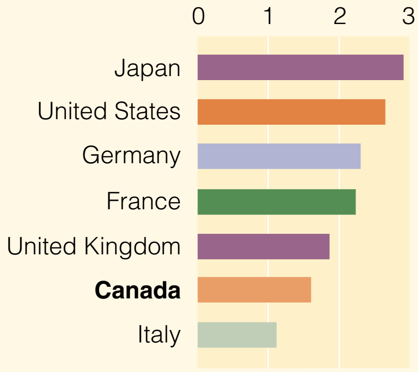
Modern View of Technological Advance

or a s os o o s s r ar olo al a a as r al o o o y a ra o o s or o o o y a s . r o ally or o s a a s s a olo al o l o rr , a ay or a or ro s (a o o l s, a r la s) a ro o ro ss s (ass ly l s). r s a s r s, a a s o a , or ora olo y o r ro s or ro ss s o a or a a r ro . a r a a ro r a a s s, y s l a o lo -r l r os o s. l o olo al a a as ally or a

GLOBAL PERSPECTIVE 12.1

Total R&D expenditures as a percentage of GDP, selected nations 1999

Relative R&D spending varies among the seven leading industrial nations. From a microeconomic perspective, R&D helps promote economic efficiency; from a macroeconomic perspective, R&D helps promote economic growth.



Source: National Science Foundation, <www.nsf.gov>.

o o o y, o o s s l as roo a a o s , s lar ly r al o ar sys .
os o orary o o s s a a r . y s a al s s l as r or o olo al a a . r , o , o a o , a s o r r s o s o s o o y, a a olo al a a s *in e nal* o a al s . ally, olo al a a ar s s ro s r alry a o als a r s a o a s o s a lo ro o or s or o a s o or s. a r alry o rs o a o s r s a s r s a r s. or o r, a y a a s r s o l ar o a , a l as ar , y ros o o r al a l a l y a al ro . o r , r r rs a o r o a ors ar a ar o olo al a a .

<www.interlog.com/ ~womenip/> Women inventors project

ROLE OF ENTREPRENEURS AND OTHER INNOVATORS

ll l l o s s r r rs a o r o a ors

- *Entrepreneurs* all a r r r s a a or, o a or, a r s ar r a alys o o s la , la o r, a a al r so r s a ays o ro oo s a s r s. as a s l - al, or a l , ar ass y ar a ry, ry or a o o- l s, a ra ss l a s, arr o r r r al rol . a a s as a r o o , all o , llo a , , s l , ro ra y, a l o r all a a al s r a . o ay's or olo ally o l o o y, r r rs s s as l ly o arr o y r r r al a s. a s ay l o ly o or r o l or as r o oss s o so ro or a, or ay o s s o lar r ro s o r r rs o a ool r a al r so r s.

- ***Other innovators*** s s a o l so r y o l ol rs o o a o o o o ar rso al a al r s . o ar y s, s s s, a o r salar loy s a o r- al & a s. (y ar so s r rr o as *in a ene* , s y ro s r o r r rs s r s.)

Forming Start-Ups

START-UPS Small new companies that focus on creating and introducing a new product or employing a new production or distribution technique.

r r rs o or s all o a s all **start-ups** a o s o r- a a ro a ro or loy a ro o or s r - o . o o l , or o o r ara s, or s a s ar - -1 0s. r o r loy rs l - a ar a ar , lo r o o (rs o a) as r s r ro o y r- so al o r, y o r o o a y l o rs. r a - l s o s ss l s ar - s ar , a o olo y r s al al r a s o , a s ll r o o r o a or l, l- o s o a ra s so ar .

Innovating within Existing Firms

o a ors ar also a or s or ora o s, lar a s all. o- a ors ar salar or rs, o a y r s a ay sys s a ro s s a al o s s or s ar s o ro . a l s o r s o or r s ll l r al o a ors ar or ora o , . . lo r o o a , os - o s, a s la s la o a a o , a a s lo r o las r or rso al o rs a r rs. & or a or or ora- o s as ro s a olo al ro s s ro s as l- s o s s, l o s, o a l a s, a o o l s, a o o l r s, a s or .

o lar r s, a ar a ss r a ra y a s r a a olo al a a , a s l ar o r & a a a r s o s o or , or l , o a r s. s a a l o s as o r s or l, a l o a & r r a y ll a a a.

Anticipating the Future

o 0 y ars a o a r r or *Po la Mechanic* a a ol ly r , o - rs r ay o or a 1. o s. o ay's o oo o - rs l ss a o lo ra s. s l o a a r , a s a o a ors ry o o. os s ro a a ory a l y a r a o a a a or ro a ro ro s or s r s a s r . r ar s ar o o ary a o o ary. ro o a o a lo ar r a a o rs, s a l r ar s as rso al sa s a o . lso, a y o l s ly oy ar a o o- s . o rs , rs a r a o ary r ar s or o o- o ro s, s o a r a o , or lar o s s. r a l s ar ll Ga s a a l ll , o o roso 1 a a a or 2000 o . .$ ll o a . .$ 0 ll o , r s ly, a ly or o roso s o . as s ss s o r r rs a o a r s a ss or so r s or r r o a o s a a a o s r a s. l o y ay o s - a s o , ar s o r s ro o o oo s a s r -

s o s ss s a a o s s ly s ll o s r a s. ar o s o ar r s r r rs a o a r s ar a a a , r a , ra l a , a a s , G r a , or ss. r r rs a o a o ar lo al s o .

Exploiting University and Government Scientific Research

ly a s all r a o & s o s o as s r s ar . r a- so a r a s so s all s a s r l s, as s , a o a , or o y s ally a a o r al s s. s o l s ly or a o olo al a a . or a r aso , r r - rs s y s o o rs y a o r la ora or s o - y s o r s o r al a l a l y.

Go r a rs y la s a s o a y olo al r a ro s. r - s r s s as o rs a o olo y, or a l , a r roo s a or r s ar rs s a o r la o- ra or s, a a o s s ro s o s o a os - olo ally ro r ss r s a s r s.

lso, r s r as ly l o rs y r s ar a r la s o r ro - s. s ss o & a rs s as ro ra ly. o ay, s a- ra o rs y s s s a o a ors s arro s s s a rs s r as ly r al a r or ay a o r al al a ar a o a ors o s ar o al ro . r s, o o rs , ro a l o o as s r s ar o r o . s o l a a a s ar r a a o or a ro . s s ar larly r ar a al s ry, r s o o o or r s o arlay s o l ra r or ora la s o , a a l r s.

QUICK REVIEW

- Broadly defined, technological advance means new or improved products and services and new or improved production and distribution processes.
- Invention is the *discovery* of a new product or method; innovation is the *successful commercial application* of some invention; and diffusion is the *widespread imitation* of the innovation.
- Many economists view technological advance as mainly a response to profit opportunities arising within a capitalist economy.
- Technological advance is fostered by entrepreneurs and other innovators and is supported by the scientific research of universities and government-sponsored laboratories.

A Firm's Optimal Amount of R&D

o o s a r o s o al a o o r s ar a lo a a o s o r 's r o o ar al a ar al os o & a y. s o r l r o s ro as o o s o ar r a s ro , a a ar lar a y l s ar al ( ) als s ar al os ( ). r a s s ar al o a ar lar &

a y, say, o a o , as ar al os s o l a a a y. o ras , a a y os ar al ro s s o l ss a s ar al os s o l a . & s s o s o l , s ol s a r s sa r or a r a . l os o & s a , s o r a so r a ar ly r a , so s - a os s so or ar s . r l ss, ay o r a s r l a or a aly & s o s.

Interest-Rate Cost of Funds

r s a s ral ays o o a s y o a & a s

- ***Bank loans*** o r s ar a l o o a a loa ro a a or o r a - al s o . os o s s s r s a o l r. ar al os s os r ra ollar orro , s s ly ar r s ra or orro s.
- ***Bonds*** s a l s , ro a l r s ay a l o orro s or & y ss o s a s ll o ar . s as , os s r s a o l rs o ol rs. a , ar al os o s s s r s ra .
- ***Retained earnings*** lar , ll- s a l s r ay a l o ra o s o or ora sa s o a & . y ally, s a r r a s ar o s ro ra r a ay all o as s o or ora o rs. o o s r or ora ro , all *e ained ea ning* , a s o a & a y. ar al os s ra a os s o l a ar r s as os s a a al s o .
- ***Venture capital*** s all r s ar - r a l o a ra r a - al o a s & ro s. r a al s a al a al, or s ly o y, o r al a al. **Venture capital** o s s s o a ar o o s ol sa - s o a -r s s ss r s a or s ar s o ro r s s . ar al os o r a al s s ar o ro a r ll a o ay o os o ro o y. s s ar a s a as a r a o r a al, so s ss ally a r s ra .

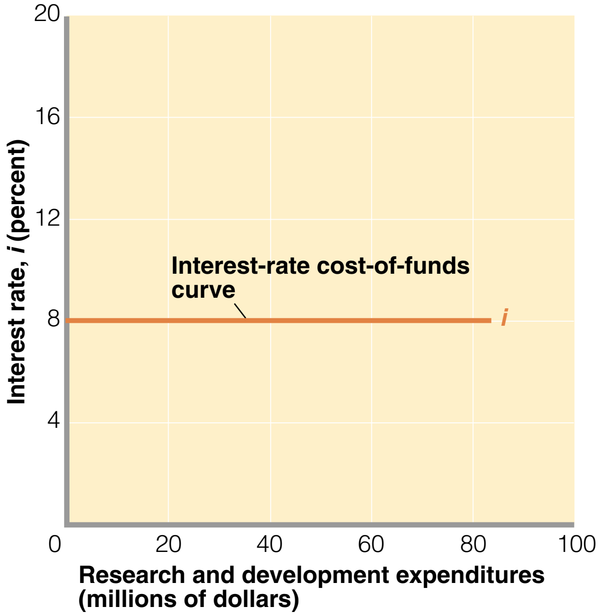
VENTURE CAPITAL Financial capital lent in return for a share in the business.

- ***Personal savings*** ally, al r r rs ra o r o sa s o a & or a r . ar al os o a - s or o r s ra .

s, a r so r o & s, a s a ar al os o s s as a r s ra , *i.* or s l y, l 's ass a s r s ra s sa o a r o a s r r . r r, ass a a r a r all s ay a r s ra o r , l as s - a a la l o . a ra o ar al os o a a o or s r s a or o al l a r r s ra , as s o r 12-1. a ra s all a **interest-rate cost-of-funds curve**. s o lls s a a orro $10, $10,000, $10,000,000 or or a r r s ra . a l a o a y ra o a s a a s o o s r ra a lls s sa . s a a a , a s o r o & o a o y ar.

INTEREST-RATE COST-OF-FUNDS CURVE A graph showing the interest rate a firm must pay to obtain funds to finance R&D.

FIGURE 12-1 THE INTEREST-RATE COST-OF-FUNDS SCHEDULE AND CURVE



R&D, millions	Interest-rate cost of funds, %
$10	8
20	8
30	8
40	8
50	8
60	8
70	8
80	8

As it relates to R&D, a firm's interest-rate cost-of-funds schedule (the table) and curve (the graph) show the interest rate the firm must pay to obtain any particular amount of funds to finance R&D. Curve *i* indicates that the firm can finance as little or as much R&D as it wants at a constant 8 percent rate of interest.

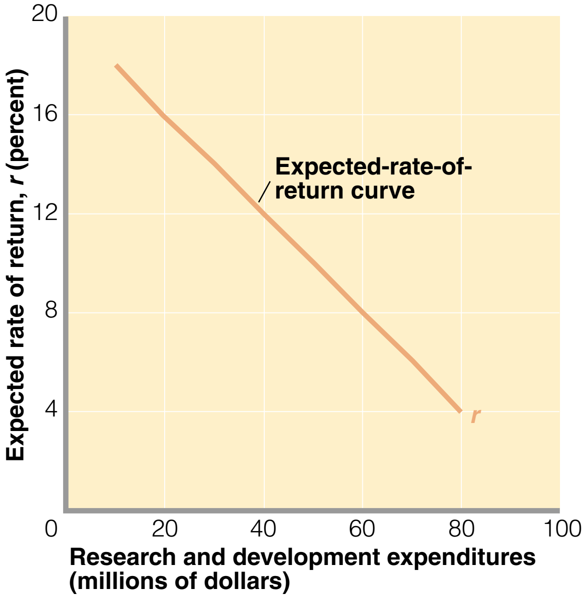
Expected Rate of Return

r ’s ar al ro & s s ro (or r r) ro las (ar al) ollar s o & . a s, & s o r s l a ro or ro o o a ll r as r , r ro o os s, or o (ays ll soo la). s r r s o r a r s r s & s o s. ’s s os a a r o s r s r s s, a a s a a & r o $1 ll o ll r s l a ro a ll y l a o - a ro o $1.2 ll o a y ar la r. ra o r r , , o $1 ll o & r (a r $1 ll o as r a) s 20 r ($200,000/ $1,000,000). s s ar al o rs $1 ll o o & . (r r r o r s ral y ars o l a s o a o o , o s o al r as a alys s.) a s s sa o o s a ra s o r r or & r s o $2 ll o , $ ll o , $ ll o , a so o . os os ar al ra s o r r ar o s a a l r 12-2, r y ar also ra as **expected-rate-of-return curve**. s r s o s ra o r r , s ar al , o a ollar o r o & . r slo s o ar a s o s r r s o & r s. r ll r s al & r s o s -ra -o -r r a s a s a o al or a s s s-s ly lo r ra s o r r . a s, as r r as s & s , s s o a & a s ro r ss ly lo r ra s o r r .

<www.bothell.washington.edu/faculty/danby/bls324/surplus.html>
Demand, supply, and surpluses

EXPECTED-RATE-OF-RETURN CURVE The increase in profit a firm anticipates it will obtain by investing in R&D.

FIGURE 12-2 THE EXPECTED-RATE-OF-RETURN SCHEDULE AND CURVE



R&D, millions	Expected rate of return, %
$10	18
20	16
30	14
40	12
50	10
60	8
70	6
80	4

As they relate to R&D, a firm's expected-rate-of-return schedule (the table) and curve (the graph) show the firm's expected gain in profit, as a percentage of R&D spending, for each level of R&D spending. Curve *r* slopes downward because the firm assesses its potential R&D projects in descending order of expected rates of return.

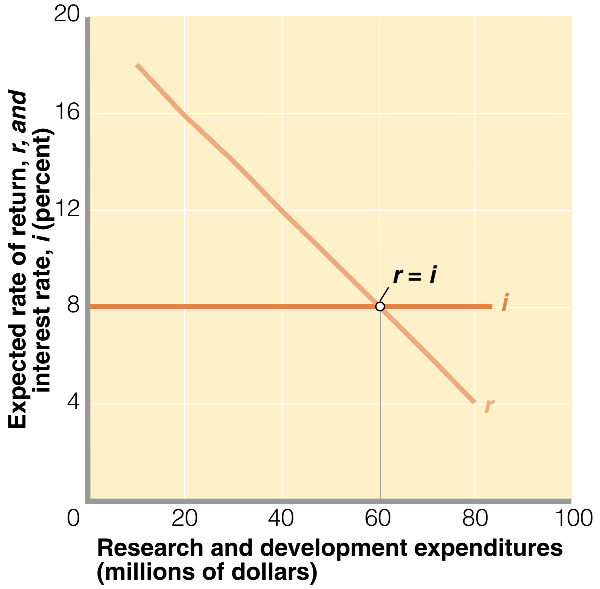
Optimal R&D Expenditures

OPTIMAL AMOUNT OF R&D The amount of funding for which the expected rate of return and the interest cost of borrowing are equal.

r 12- o s r s -ra - os -o - s r (r 12-1) a -ra -o -r r r (r 12-2). r s rs a 's **optimal amount of R D,** s $ 0 ll o . s a o a also r ro a l as a o o or ra o r r a r s os o orro ar al (r , r). o r a a l ll s a a $ 0 ll o o & r s, ar al a ar al os o las ollar s o & ar al. s r s o l r a all & r s o $ 0 ll o , s os o lays y l a r ar al or ra o r r , , a r ar al os or r s -ra os o orro , *i.* s o l o r a & r s yo $ 0 ll o or s o lays, (ar al) s l ss a *i* (ar al os). ly a $ 0 l-l o o a *i,* ll s a ll s $ 0 ll o o & . r a alys s r or s o or a o s

1. ***Optimal versus affordable R&D*** ro arl r s ss o s o r a oo , as ll as oo l l , o a oo . o s & a o-lo al a a . r 12- s o s a & r s a s s o a r o ly as lo as r r ro o lay als or s os o o a s o a . a y & r s ay a or a l o or l , a s r ar al s l ly o l ss a r ar al os .

FIGURE 12-3 A FIRM'S OPTIMAL LEVEL OF R&D EXPENDITURES



Expected rate of return, %	R&D, millions	Interest-rate cost of funds, %
18	$10	8
16	20	8
14	30	8
12	40	8
10	50	8
8	***60***	***8***
6	70	8
4	80	8

The firm's optimal level of R&D expenditures ($60 million) occurs where its expected rate of return equals the interest-rate cost of funds, as shown in both the table and the graph. At $60 million of R&D spending, the firm has taken advantage of all R&D opportunities for which the expected rate of return, *r*, exceeds or equals the 8 percent interest cost of borrowing, *i*.

2. ***Expected, not guaranteed, returns*** o o s ro & ar , o ara . 20/20 s , a r a al ays loo a a r a ar lar r or & as or l , a ass ss s rr l a o or al s o . o s o , r as o o or l , as o s or a o a a o s. o & s o s ay or l a or a l a y al s- ss s o . o a o a o , ar lar, arry a r a al o r s . or ry s ss l o o , r ar s or s o os ly sa o - s. (*Key Questions 4 and 5*)

INCREASED PROFIT VIA INNOVATION

s ss o a r r s s o al a o o & s , s- s s o o o olo al a a r as a r 's ro . l o a s r ay s o o s y r as r or r ro- o os s s s a a y lor s o o al o o s so a l.

Increased Revenue via Product Innovation

r s r a a roa a ro a ly ro r s o ro s as o or r a s. a l s l l s a s, ro a o or , or l ss r lls, al a ras, a or rs, a ro o s. r ro s ar s o oar s, ll lar o s, l o a rs, a a o o l a r a s. ll s s r olo al a a or o ro o a o . o o s ro s a o s r a a s yo o ro a - r , o a r sa s a o , o s rs r as ro s a a s ar al l y r ollar. y r ro s o y o r l o y o y o ar ra os o / r or ar o s oo s. y rs s l o oo s / r ra o, o s , a so o , l r o s s .

rs ol s o a l 12-1 r a so o or a o a l -1. or ro o o ro , o s r a o al l y ro $10 o o y y o s o a $1 r a o r s o a $2 r . o al $10 as s , $2 s o a $ o . s s o ol s 2( ) a ( ), ar al l y r ollar s o las o a ro as (/$1 1 /$2). o al l y, r ro ol s 2(a) a (a), as ls (10 + ro rs 2 s o l s 2 + 20 + 1 + 1 ro rs s o). (yo ar r a a o s o o , l as r s ss o o a l -1.)

o s os a o a r o rs ro (ol s (a) a ( ) a l 12-1), r a $ r . o a rs o as a r ar al l y r ollar (1) a a y o a a a s o o a rs o a al / r ra os o 12. o a sa s a o , o - s r o ys o s o a $ r , o o a $2 r , a ro s o . r o s r as s r $10 o o ($ o a $2 o), a / r ra os o las s o a ar al a 12. as r- a ol s (a) a (a), o s r's o al l y s o 12 ls (2 ro rs o l s 2 + ro rs 2 s o). o al l y as r as y 2 ls (12 ls ls) a a s y ro as r- as . *Con me ill b a ne od c onl if i inc ea e he o al ili he ob ain f om hei limi ed income.*

TABLE 12-1 UTILITY MAXIMIZATION WITH THE INTRODUCTION OF A NEW PRODUCT (INCOME = $10)*

(1) Unit of product	(2) Product A: price = $1		(3) Product B: price = $2		(4) New product C: price = $4	
	(a) Marginal utility, utils	(b) Marginal utility per dollar (MU/price)	(a) Marginal utility, utils	(b) Marginal utility per dollar (MU/price)	(a) Marginal utility, utils	(b) Marginal utility per dollar (MU/price)
First	10	10	24	***12***	52	13
Second	8	***8***	20	10	48	***12***
Third	7	7	18	9	44	11
Fourth	6	6	16	***8***	36	9
Fifth	5	5	12	6	32	8

* s ass s a l a a o o ar al l y r ro a o al s o a o r ro s s - o a y r as o o r ro s. or a l , ar al l y s l or ro s o a o o a r as y o s r.

ro o a r 's rs , s ollar o s r r s - ro a a y l s r as r . r- r s r- os , ro o a o r a s r- ro . o al ro r s s y r- ro l l y r o s sol . s a r a o or al & r , r s o al ro s r r o a & r . as as s or -ra -o -r r r r 12-2. ral o r r la o s ar or o

- *Importance of price* o s r a a o a ro s o o s ar al l y a s r . (o r a o s r r r s a l 12-1 o l y ro s o ro s r r $ ra r a $.) o s ss l, a ro s o o ly l r l y o o - s rs o so a a a a l r .

- *Unsuccessful new products* or ry s ss l ro , r s o o s r r a o a s ro o a o s o al ays r al . a l s o olossal ro o s ar or 's s l a o o- l , - o s, a ra o s r o, o y o a- ola, o a s a ras, a o al 's a r r. ss ra a a l r s l r s o o . o r s a a r ly a l . a as , ll o s o ollars o & a ro o o s l a ly r s l loss, o ro .

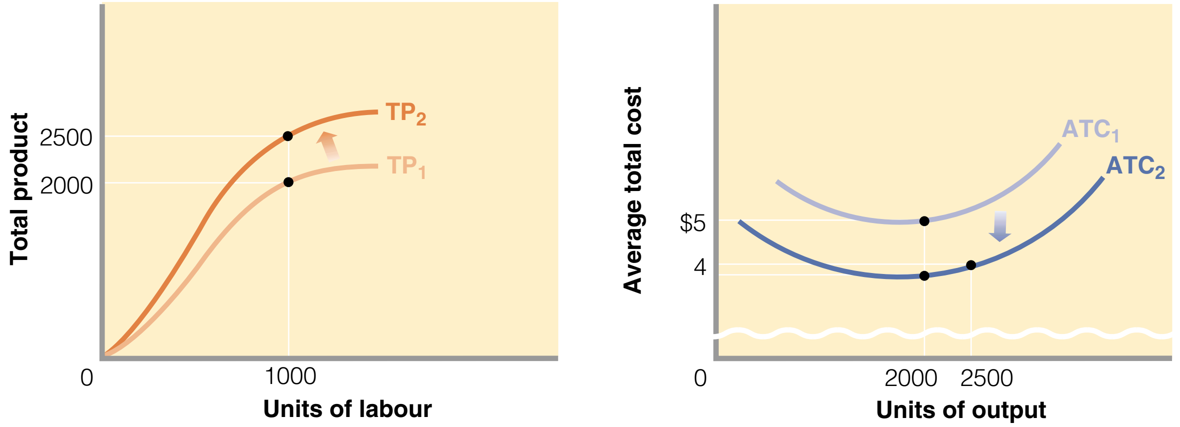
- *Product improvements* os ro o a o o s s s o r al ro s o s ro s ra r a ra al o s, s as or l- a o o l s, ar s o a, l r- s a s or ol l s, or a o r l l - , ro s o s or o a s, a lo a o r l - r a r s. (*Key Question 6*)

Reduced Cost via Process Innovation

ro o o r o s o ro ro s ro ss o a o s also a a o ar a ro a a os r r o & r s. - os a r ro s a a r ro o ro ss, say, ass l s ro y a s ra r a y a s a ar ass ly l . l r a ly, s os s r r la s ol or ro o y - olo al a a . r as , o a o y l s a ar s r 's o al- ro r ro $_1$ o $_2$ r 12- (a). o or s o o a ro a a l l o r so r sa . o ro r , or a l , a s r a o ro 2 00 s o o , ra r a 2000 s, s 1000 s o la o r. o s a ra ro as r as ro 2 (2000 s o o 1000 s o la o r) o 2. (2 00 s o o 1000 s o la o r). r s l s a o ar s r 's a ra - o al- os r , ro $_1$ o $_2$ r 12- ( ). o rs a y, l 's ass s r ays $1000 or s o s a al a $ or a o la o r. s s 1000 s o la o r, s la o r os s $ 000 ($ × 1000) s a al os s $1000 a s s o al os s $10,000. s o r as s ro 2000 o 2 00 s as a r s l o ro ss o a o , s o al os r a s $10,000, a s a ra o al os l s ro $ ($10,000/2000) o $ ($10,000/2 00). l r a ly, r o l ro- or al 2000 s o o r s o la o r a a lo r a ra o al os .

s r o a ra o al os a s r 's ro . s a r a o & r a os r , s ra ro s r r , as s or ra -o -r r - r r 12-2. s as ,

FIGURE 12-4 PROCESS INNOVATION, TOTAL PRODUCT, AND AVERAGE TOTAL COST



(a) Upward shift of the total-product curve

(b) Downward shift of the average-total-cost curve

Panel (a): Process innovation shifts a firm's total-product curve upward from TP_1 to TP_2, meaning that with a given amount of capital, the firm can produce more output at each level of labour input. As shown, with 1000 units of labour it can produce 2500 rather than 2000 units of output. Panel (b): The upward shift in the total-product curve results in a downward shift in the firm's average-total-cost curve, from ATC_1 to ATC_2. This shift means the firm can produce any particular unit of output at a lower average total cost than it could previously. For example, the original 2000 units can be produced at less than $4 per unit, versus $5 per unit originally. Or 2500 units can now be produced at $4 per unit.

ra o r r aros ro ros o lo r ro o os s ro ro ss o a o .

o s r s a l o r- as ory o rol sys s, s as os o r y al- ar , a l o a ors o r r o o l - ra o or s a la r or rs o sol oo s. y also a l r s o oo s arr s , r os o s or or s. o - s a r as s sal s r or r, l s a ra o al os , a r as ro . (*Key Question 8*)

IMITATION AND R&D INCENTIVES

IMITATION PROBLEM A firm's rivals may be able to imitate the new product or process, greatly reducing the originator's profit from its R&D effort.

r a alys s o ro a ro ss o a o la s o olo al a a a s a r 's ro , also s a a o al **imitation problem** a r 's r als ay a l o a ro or ro ss, r a ly r or - a or's ro ro s & or . s s o a l , 1 0s or r - a a o r s oo a ar a a s o a or s, y , o s o r s r s o r al y. s r rs r ro ally as r- arl r y a a s l . . r s o or ora o a a- r s o r o ars. s y o a o s r ly l a a lly a a s o a a o s r a s o o a o a o .

a , a o a r a s a lar ro s ro s s ro s ay l s all r r s s ry r os s o ro o a o l los ly o ors r s ss s a a l r s. o a r o s ly o a a y s ss l ro s oal s o o s o r o ra o a o . s s so- all **fast-second strategy**, o a r o s o s o ro - ro a l s, ar ro ss, or o o s o s al o r a l.

FAST-SECOND STRATEGY The strategy of becoming the second firm to embrace an innovation, allowing the originator to incur the initial high costs of innovation.

Benefits of Being First

a o a as -s o s ra y ra s a or a s o a s r or a y r o ar s s a r s s o o a o o ors a a r or ro ro y o l o rs ar os s a r s s o ro lo a s a s ss l o a o s l o a s a s ay a la s l s ra y so s a o s, r ar s - ral ro o s or, a o al a a a s o, a l a .

PATENTS

o olo al r a ro s, s ally o s, a a . a , y a o l ally a or al os o a s. r os o a s s, a , o r a o a s a o or a & . or a l , olaro ’s a o s s a a ra a l o ar o o ro s or a y y ars. o a lo a ra, olaro o a a - r la s a a s s r al. o a o o ly a o s o ro s rs o o a ra a o y a o a s a a - ras a sol a ay ll o s o ollars a a s o olaro .

COPYRIGHTS AND TRADEMARKS

Co igh ro l s rs o oo s, o r so ar , o s, os, a s al o os o s ro a r or s o . *T adema k* or al o a ors o ro s l s r o s a ar lar ro a (& s, ar oll, a s). y r ro l o r o y , s l al ro- o s r as or ro o a o . y a s r orl ro r r a o al ra a r s.

BRAND-NAME RECOGNITION

lo ra ar ro o , ra - a r o o ay or al o a or a a or ar a a a or y ars or a s. o s rs o y a ro r a rs ro a o lar ass ar . a l s ’s l a s, l ’s so ss s, o so a o so ’s a - s, o y’s al a , a llo ’s or la s.

TRADE SECRETS AND LEARNING BY DOING

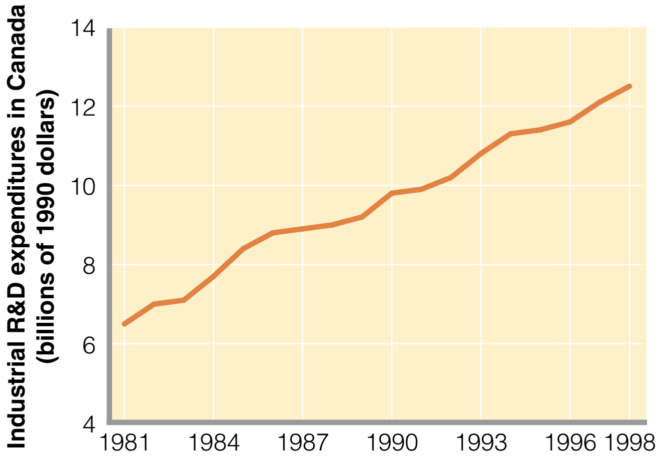
o o a o s ol ra s r s, o o ors a o a ro or ro ss. or a l , o a- ola as s ss lly s or la or o a s r ro o al r als. a y o r r s a r s al ro- o s o o ly o . a r la a a a , a r ’s a -s ar a ro o allo s o a s s a al os r o s ro l ar y o . o a or’s lo r os ay a l o o o ro a r a ors a r ar .

TIME LAGS

la s o a o a s o o a l o a r s o r al- a s s a al o o ro . a s or a a or o a o l o

FIGURE 12-5 THE GROWTH OF BUSINESS R&D EXPENDITURES IN CANADA, 1981–1998

Inflation-adjusted R&D expenditures by firms are substantial and growing, suggesting that R&D continues to be profitable for firms, even in the face of possible imitation.



Source: a o al o a o . . s . o .

ro r s o a o a o . o as a o l , a or
s s a s s ro , ar a a ory or s ro o , a o
a ar a a . ar o s ry arr rs s as lar a al r r s,
o o s o s al , a r - ay la o a o
a a o . ra , ay a y ars or a s or r al r s a
s ss lly a a ro a l ro a o ar s ar o
o a or. a , o a or o s o ro .

PROFITABLE BUYOUTS

al a a a o rs ar s s ro oss l y o a yo (o r r-
as) o o a r y a lar r r . r , o a r r rs
a r r ar s a ly, as as or as s ar s r as r , ra r
a a or r a s r a lo -r ro s ro r o ro o a
ar or s.

s or , s a o ro l , r ar s a ro o s a
a a a s a a l os o a r s o ro ro r & or s, as
l y o l ls o & s y r s y ar a r y ar. s
s o r 12- , s ss & s a a a o o ly r a s s -
s a al as ro o r as ar r- ry. l ls o s
s ly o l o o a o o s s ly a s r ly r ss ra s o
r r o & r s.

QUICK REVIEW

- A firm's optimal R&D expenditure is the amount at which the expected rate of return (marginal benefit) from the R&D expenditure just equals the interest-rate cost of borrowing (marginal cost) required to finance it.

- Product innovation can entice consumers to substitute a new product for existing products to increase their total utility, thereby increasing the innovating firm's revenue and profit.
- Process innovation can lower a firm's production costs and increase its profit by increasing total product and decreasing average total cost.
- A firm faces reduced profitability from R&D if competitors can successfully imitate its new product or process. Nevertheless, being first has significant potential protections and benefits, including patents, copyrights, and trademarks; brand-name recognition, trade secrets, and cost reductions from learning by doing; and major time lags between innovation and imitation.

ROLE OF MARKET STRUCTURE

o o r s ss o o ar s r r s as r a rs, s lo-
al o as r so ar lar ar s r r or r s s s s o
olo al ro r ss. s a ly o s ry o r s o sa s o
r la ly s all r s r ra l o a s ry o r s o ly o or r lar
r s r s so r a s r r s

Market Structure and Technological Advance

s a rs s o ar a s r s s o s, s r y s r s a s or-
o s o o r o r ar o ls as r la o olo al a a .

PURE COMPETITION

o s a r o or a a s ro a s ro a l y o r a
& os s , s ro o o ro s a r aso or s r s
o o a o r s o l ss o la a o o ol s s. a
r o or o s o s a , o or or r als ay ro
a ro or os -r ro o a o l r r
ro ar . s a a r o s or - r ro a lo - r s r al, r
o or s r o al r ss r o ro ro s a lo r os s
ro o a o . lso, r r ar a y o r s, r s l ss
a a a a or ro a ro or ro ss ll o rloo y a
s l r .

a s , ra o r r o & ay lo or -
a or a r o or. a s o asy ry, s ro r ar s ro o a-
o ay ly o a ay y s or r r s a also ro
ro or a o olo y. lso, s all s o o
r s a a a y ar o ly a or al ro lo r l a s o s r-
o s s o s a o r y a a s s a al & ro ra s. s r rs
a o a ra o olo al a a r ly o
a r l ral s ry, or a l , as o o ro & o al ar -
rs ro o r -s o sor r s ar a ro lo o r l -
rs, y r s , a ar l s y ol o ol s - r s.

MONOPOLISTIC COMPETITION

r o ors, o o ol s o ors a o a or o o la .
l r o ors, s ll s a ar ro s, o o ol s o -
ors a a s ro ro o a ro lo . s
o r a r ro s ro os o o ors s s ro
a a s ly o l ro s ay r a o o oly o r a s o o

ro . a l s a o o o a r s (o al ’s, lo s r o) a s ar o as o o ol s o ors lo al ar s soo a o - s ra l a o al ar o r, a a o o ro .
or y al r , o r, s or o s o o o ol s o o r la o o olo al a a ar sa as os o r o o . os o o ol s o ors r a s all, l s r a l y o s r - s a or & . a o , o o ol s o ors l o ra lar ro s ro olo al a a s. y o o ro s ro o- a o ar s ally orary, a s ry o o o ol s ally o s- r s s r la ly asy. lo r , ra s s lar oo s r a or o a or’s ro , l a o a or o ly a or al ro . o o ol s o ors, r or , s ally a r la ly lo ra s o r r o & r s.

OLIGOPOLY

a y o ara r s s o ol o oly ar o o olo al a a . rs , lar s o ol o ol s s a l s o a o lar & os s asso a a or ro or ro ss o a o . ar lar, y - al ol o ol s r al s o o o o ro s, a ar o s r a . s s r ro s r s as a a or so r o r a ly a a la l , r la ly lo - os or & . or o r, s o arr rs o ry s ol o - ol s so ass ra a a a a a y o o ro a s ro o a o . , oo, lar sal s ol o ol o ol s a l s o s r a os o s al & a a s o s al r s ar rs o r a r a a y s o o . ally, roa s o o & a y ol o - ol s r s l s o s a l & ss s or a o - sa & s. s, ol o ol s s l arly a a s a o o a .

& ol o oly also as a a s . a y s a s, ol o o- l s ’s o o a ay ar l ss a a l a o , a s ol - o oly s o r o la y. ol o ol s ay r aso a a s l l s s o ro os ly olo y a ro ro s r- r ly s ar a s a l o o ro o . ol o ol s a s o a s ro y lo lly all s a al ass s. y r s o lo a ro (say, a r s or l r a o o l s) a ro ’s s ss ll r r o sol o r ’s rr s o ro s s ro (say, asol s) s o l o ol o ol s s- r s lar s r s’ r s & as o s s l, ar , a al s r s, or a l .

PURE MONOPOLY

ral, r o o ol s as l l o a & a a s s ro ro ry arr rs a , ory, ar o l . o ly - or r o o ol s o a & s s o r r s o l s y so ro or ro o ro ss a s roys s o o oly. s a ro s o r o s o r , o o ol s ay a a o . y so o , a r lo ro or ro ss or o o o oly ro or s r ss ro l as ra a ro ro s rr a al ass s. , ral, o o s s a r a r o o oly s ar s r r l as o o o a o .

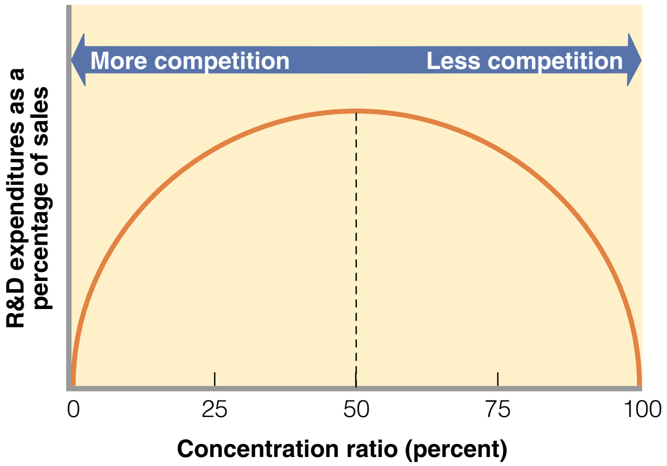
Inverted-U Theory

INVERTED-U THEORY OF R&D A theory saying that, other things being equal, R&D expenditures as a percentage of sales rise with industry concentration, reach a peak at a four-firm concentration ratio of about 50 percent, and then fall as concentration further increases.

alys s l s as l so r s o olo al ro r ss o os la a so- all **inverted-U theory** o r la o s ar s r r a o- lo al a a . s ory s ll s ra r 12- , r la s & s as a r a o a r 's sal s (r al a s) o s ry's o r- r o ra o ra o (or o al a s). r - s a o r s s s a & or s a s a o ry lo o ra o s r s (r o - o) a ry o ra o s r s (r o o oly). ar ro lo s o ra o s, & s as a r a o sal s r s s o ra- o l a o ra o ra o o 0 r or so s r a , a a o r lar s r s a o or a o o - al o al s ry o . yo a , r l- a & s r as s as o ra o r s s. lo o r - ory ollo s ro o r s ss o . r s s- r s ry lo o ra o ra os ar a ly o r s. y ar s all, a s l or o a & . ry o s s r s s asy, a l o s s a o o ro ro o a o s a ar o s or y a s. s ar s l , r s s s r ss l l o & r l- a o r sal s. o r (ar r) o r , r o ra o s o ally , o o oly ro s alr a y a o a o ll o a or ro . r r or , o a o y ally r r s os ly r ool o ry lar a or s, ll o a r a o al ro s r al . s a r s l , ra o r r ro & s lo , as ar r s or & r la o sal s. ally, la o r als a s o o ol s o - la a o & . o al s ry s r r or & s o r r s o & s ar a s o a ar r a ly a a la l a s . ro o r s ss o , os a ors s o o r s r s r a r s ar a sol ly a r la ly lar r o ra o ra o s o so as o ro oro s o o y s all r r als. alry a o lar r ol o o- l s r s a o o lar r a s all r r s ro a

FIGURE 12-6

The inverted-U theory suggests that R&D expenditures as a percentage of sales rise with industry concentration until the four-firm concentration ratio reaches about 50 percent. Further increases in industry concentration are associated with lower R&D expenditures.



s ro or & . r - ory, as r r s y r 12- , also o s o ar s loos ol o oly as o al s r r or & s .

Market Structure and Technological Advance: The Evidence

o s o s ry s s a r o o r la o s ar s r r a olo al a a . a s os s s al r s r s a r o s, a s r o olo s, y ar o asy o o ar a s ar . r l ss, y ro ral s or or r - ory.[1] r s al, o al ar s r r or - olo al a a s s o a s ry r s a o lar ol o o- l s r s (a 0 o 0 r o ra o ra o), s ral ly o a s all r r s.

r o r s al al a o s or a r . r a ar lar s ry s ly al ay ll a or or a r a o & a ss r r . l so o ra s r s (l ro s, a r ra , a rol) o lar a s o r so r s o & a ar ry o a- , o rs (ar s, al , y s ro s) ar o . l l o & s a s ry s s o as o s al ara r a olo al o or s as o s ar s r r . r s ly ay or o or s o o a o r a ar a al s r s, or a - l , a r - a a oal- s r s.

o l s o r - r s o r 12- s a s l o o ral r la o s & s a ar s r r , o r s al.

TECHNOLOGICAL ADVANCE AND EFFICIENCY

Production and the Standard of Living

olo al a a o r s s a ly o o o y. a r ro ss s a ro s a l so y o ro or o , as ll as a r- al o o .

Productive Efficiency

olo al a a as o ro ss o a o ro s *od c i e ef - cienc* y r as ro y o s, as a r 12- (a), a y r a ra o al os s, as r 12- ( ). o r or s, a l s so y o ro sa a o o a ar lar oo or s r l s r s ar r so r s, r y r s r so r s o ro o r oo s a s r s. r so y s r s or o o l ss s oo , ro ss o a o a l s o a a r a r a y o sa r o r oo s. r ay, ro ss o a o a s ro y r s so y's r- os o a r o oo s a s r s oos s a s s a or a a s o s a o o y's ro o oss l s r r ar .

Allocative Efficiency

olo al a a as o *od c* (or s r) o a o a s allo a y y so y a or r rr o oo s a s r s.

---

[1] Douglas F. Greer, *Industrial Organization and Public Policy*, 3rd ed. (New York: Macmillan, 1992), pp. 680–687.

all ro o r arl r s ss o a o s rs y a ro ra r a a ol ro o ly y o r as s o al l y o a ro r l o . o sly, , ro a o ro s l s r a s a r l l o o al l y or so y.

r s o ar s, a or ro r s s a a or ol ro l s. o o ro r y ro a ra s r so r s a ay ro l ss- al s s a o ro o o ro . ory, s s o r so r s o s l r o ro als s ar al os .

r s a a a r , o r. o a o (r ro or ro ss) a r a o o oly o r ro a s or ro a y a a a so rs . o o oly o r r s l s ro a o a o , so y ay los ar o ro y o r s o l a a ro a o a o . r a so s a ro - a o o ol s r s r s o o s ro r a o ar al os . roso s a arly o a o o r so ar (s o ra sys) o a a o a r s so ar s o so ar s ry. l s o o oly o r ar ly o a s ra y o o al, a l ro ra s, ro - o o s o o s , rs o s . s ro ro s ar o a o ll a a , a rs o s o a or a or a r s o o so ar . or o r, roso as so o s o o oly o r or la so ar ro s (or , o r o). o al o so y as r a ly ro s r o ro ro s o ro roso , a o r r s l as r s ry arr rs a o o oly so ar s ry. lso, roso o s o a o o ro ar a o lo -r or al ro asso a allo a y. o r a o s y, a ral o r 2000 o roso l y o ola . . a r s la s a or r ro o o o r s. roso as a al r a r a or r o a r o r . o a o a r or s roy o o oly o r y ro o o r r o sly o s . o o y s a a a s, a s o o l s s r s o los r o ar al os a a ra o al os . o a o a l a s o r a r o o a s ry r s y asso a r r s r o o o a o o oly r s. roso a l , olo y o r as, a l as orar ly, r roso ’s o a so r ar as o so ar s ry. ally, r s s as rosys s a o r so ar r la o r (a a ro ra la a), l a roso or ar o a . o, s l o r roso ’s o o oly o r as r or a o a o . o ral s r o r a r s r 2000, roso as s $2 ll o r y ar o r s ar .

Creative Destruction

CREATIVE DESTRUCTION The hypothesis that the creation of new products and production methods simultaneously destroys the market power of existing monopolies.

o a o ay ra **creative destruction,** r r a o o ro s a ro o o s s l a o sly s roys o o oly ar os o s o r s o o s ro s a ol ays o o s ss. s s a a y y ars a o y os r, o a o a

a al s r al y s o o ro o o y, olo y, so r o s ly, y o s ss or a a o

<www.asiaweek.com/asiaweek/magazine/2000/0324/cover1.html>
Creative Destruction City

o o o a s a s os or al y a a a a s r s o a ar s o ro s o s r s a r o a o a r ry l s. s o o o s so or a a o s a a r o o ara r r o o or ary s s o s or or l ss ro ly o r l l r a ry lo r a s o a r s o r s s a y as a o o r s .[2]

a y a l s o r a s r o s 1 00s a o s, s s, a ar s r o ly a s o ra s or r l ra lroa s ro r o o oly o a ar os o o ra lroa s as, r , r y r s, a , la r, y a r la s. o s ro o o o l a r , a o o ly s o o , o s r la r all y l s o . yl lo - lay ( ) r or s s la a a -r o o ra r or s ass s all r or s a o a s s r ass s. o r s r or olo y o o s s s as a a s r r a sal s o ra o al s. l a s a las o l s a s la lass o l s a y s s. - a l as all os al s r . or o r, a o a or ll a o a ally s la a y o o - ol s a o lo r l rs s r or r or a , a y o orary o o- s s s o o r s or s l a a . s , a a r a s r o s a o a

l s a l y o o r l s a l s r s o r r a s or s l rs or lo y o r o l l s or s l rs or or r o s l s l s ro r a al s o r a s r o . or s r l al r o o ry a o o r al y rr ry o o al o rs o o ra s r s.

<www.forbes.com/global/1998/1214/0119038a.html>
Creative Destruction 101

a s, so o a r s ay a l o s s ra s s as s l r - , yo s, a ass a r s o lo ry a o o ro os o a r s a s r als. or o r, r -s o a r s a o o rs a o r o a r a s, s s s, a ar ro o a s r r ar o r. s or , l o a o ral a s o o y, so as s ay l a o r o o oly o r. r r o a o ay ally s roy a o o oly o r, ro ss o r a s r o s r a o- a or a l . o r, ra olo al a , o a o , a - y l arly ar o ssar ly o s s oss ss o o o oly o r.

CONSUMER AND PRODUCER SURPLUS AND EFFICIENCY

all ro a r 2 a allo a y as s r o o r so r s a o r s a s r s o ro oo s a s r s os a y o s rs. s a a o o a ro ’s ar al os (r) a ar al s ar al. r 2-2 o s ra allo a y s ar al os ar al s a alys s. ro y s a a ro o s arr o l as os ly a r. or a r ro- y o rs a a o a a ra o al os s a a , or ar al ro r ollar's or o s sa or all s. r s o a r 2's ro o oss l s ro r, ro y l s a o o ro o oss l s r .

---

[2] Joseph A. Schumpeter, *Capitalism, Socialism, and Democracy*, 3rd ed. (New York: Harper & Row, 1950), pp. 84–85.

[3] Walter Adams and James Brock, *The Structure of American Industry*, 9th ed. (Englewood Cliffs, NJ: Prentice-Hall, 1995), p. 310.

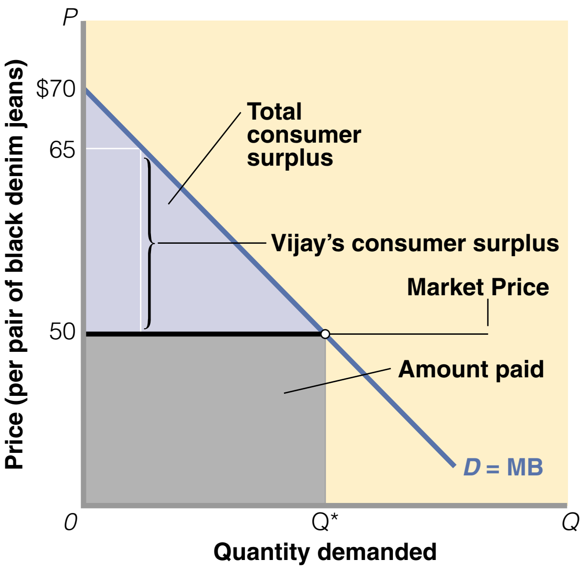
Consumer Surplus

CONSUMER SURPLUS The difference between what a consumer is willing to pay for an additional unit of a product or service and its market price.

o r ay o rs a allo a y s ro o s r s r l s, r y ro a r 's as or , a ro r s r l s. **Consumer surplus** s r a a o s r (or o s rs) s ll o ay or a a - o al o a ro or s r a s ar r . al os all ar s, o s rs oll ly o a or l y (o al sa s a o) ro r r as s a a o o r r s (ro r × a y). s r l s o l y ar s s a s so o s rs ar ll o ay or a l r r o o so. o s r ar or la a s r 12- . a r *D* lls s a a $ 0 o o s rs ar ll o y la a s, so o s rs o la a s ar ll o ay or a $ 0 ar r . or a l , ass ay s ll o ay $ l s , $ 0 r, $ a r a, o ras , s ll o ay o y or a $ 0 ar r . r ar a y o r o s rs s s ay, l s , a r s ar o ar ll o ay r s a o $ 0. ly r a ays a ly r s s ll o ay o rs r so a o o l y yo r r s. r a l y al (as r y r al o o s o a r) a $ 0 r s o s r s r l s. or a - l , ay s ll o ay $ or a a r o la a s, o ly ays $ 0 ar r , or a l y s r l s o $1 ($ 0). a o r a

FIGURE 12-7

Consumers collectively obtain more utility from their purchases of black denim jeans than their expenditure. At $50, consumers obtain a total consumer surplus represented by the blue triangle and pay the amount represented by the grey rectangle.



y r’s l ys r l s, o a o s r s r l s or all o s rs ar . o *Q** o la a s, o s rs oll ly ar ll o ay s o a o s r r s y l ra l a r y r a l . o r, o s rs o ly a o ay a o r r s y r y r a l . l ra l s r r s s o s r s r l s.

la a r 12- s o s a a o o o s r s r l s s o l ra l o l l ss s ll rs o l ar so r a o $ 0. s s o a l , a a r o $, o ly a ry s all ra l o o s r s r l s o l s . r ly o ar s r s ar o r - a rs, o s r s r l s o l s r . $ 0 s ar - l ar r a r ly o s ry, r s a o ar $, a s y ar r - a rs. y r a ar a r a o $ o l a ly los all s s ss o o r r s. or o r, o a r o o , l r r als ar al os o *Q** la a s. , s ar ass a ry a a r s l s r al o lo s a ra o al os , a s ll r s ar o ly a or al ro . y o , s ro s s s o o ro o o la a s.

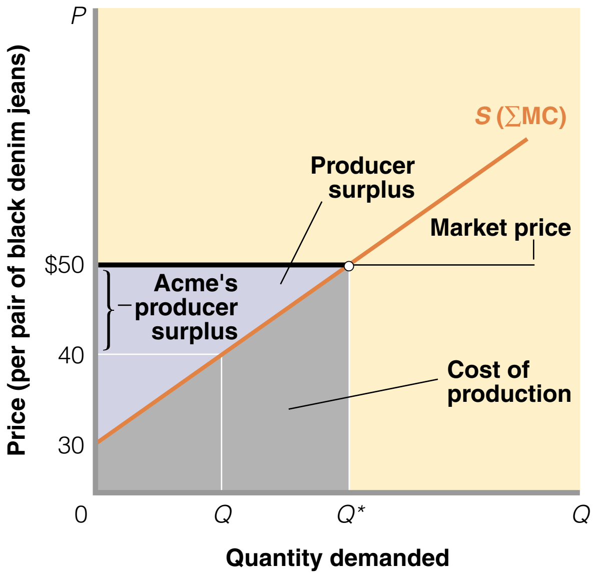
r l a r s s s y s a l s lo s r o s s o ro o , r o o y l s lar s s s a a l a o o o s r s r l s. r r ar ro r o o , s all r o s r s r l s.

PRODUCER SURPLUS The difference between what producers receive for a product or service and the marginal cost of producing it.

Producer Surplus

a o ro r s r l s s so a s lar o o s r s r l s. **Producer surplus** s r ro rs r or a ro or s r l ss ar al os o ro . o ll r all a ar al os r s a r ’s s ly r . a a , l ’s loo a ar or la a s, s o so s ly s . r 12- s s ly r or la a s

FIGURE 12-8



At a price of $30 or less, no black denim jeans are supplied. If Acme can supply black denim jeans at $40 a pair but is able to sell them at $50, Acme realizes a $10 producer surplus on each pair. Collectively, producers realize a producer surplus represented by the blue triangle, while the shaded area under the supply curve represents the marginal cost of producing black denim jeans.

sa ar r o $ 0 a a y o Q*. alo o s o o o s rs ll- o ay r r s or la a s, ro rs ar ll o s ly la a s a r r s, o r os s.

$ 0 s l rs ar o ll o o r a y la a s. a a y r a o $ 0 a lo $ 0 r a r o a , r s so ro rs r l s. or a - l , or ora o s ll o o r Q_1 o la a s a $ 0, ar r s $ 0, o a y o l r al a ro r s r l s o $10 r a r o a s. a $ 0 ar r ro rs oll ly ll r al a ro rs r l s r r s y l r a l r 12- . s a ar a r s ly r r r s s ar al os o ro la a s.

Efficiency Restated

r 12- r s o r r 12- a 12- . s a ar l r a r ly o s ry. a s a ar s a a l r r a a y, s o o s r a ro r s r l s s a . o s rs ar s r o la a s y s r a al . o r ay o loo a s a a l r r , ll ss o ay als o or - y os o ro la a s. l ss a Q* r la a s a or o so o r oo , l s r s, ar ro a o s rs al l ss a la a s. a r ly o s ry, r o la a s ll r s , r a o o o ro , ll r or r s o ro la a s. ro o o or la a s ll r r r , l ar al os als ar al a a . o ll r all a arr a sa o l s o a r 2's r 2-2. llo a - y s a ar al o so y o o or o la a s s als ar al os o ro .

FIGURE 12-9

Economic resources are used efficiently when the sum of consumer and producer surpluses are maximized. It is also the price and quantity at which MC = MB. Consumer surplus is depicted by the green area below the demand curve. Producer surplus is depicted by the blue area above the supply curve.

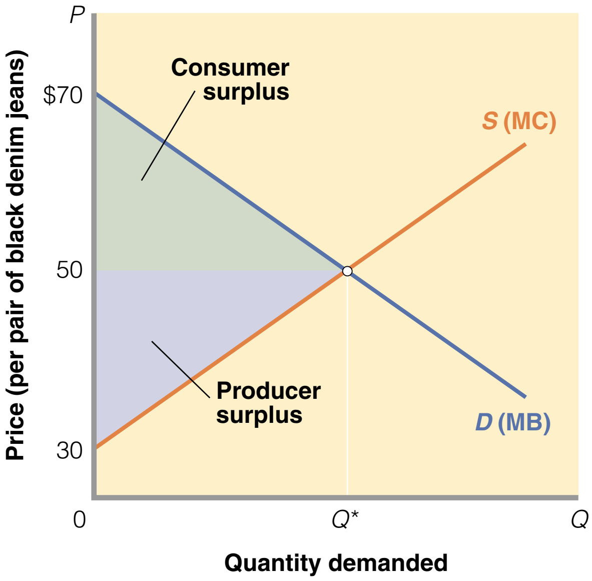
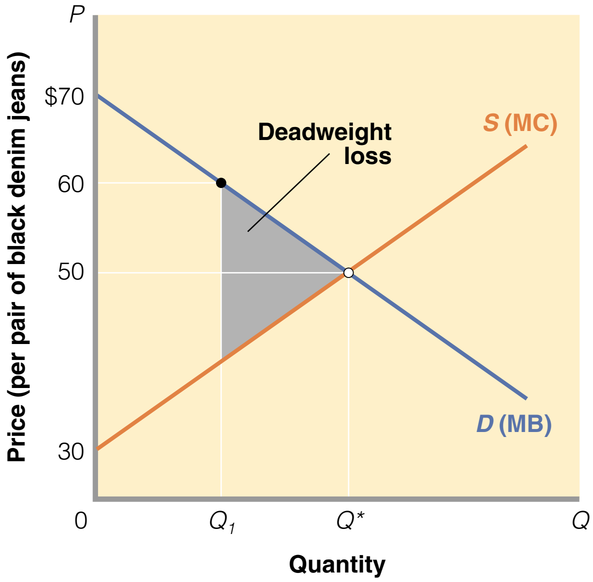


FIGURE 12-10 INEFFICIENCY AND DEADWEIGHT LOSS

At prices above the $50 equilibrium, for example, $60, consumer surplus and producer surplus are not maximized. The reduction is called deadweight loss. There is also deadweight loss to the right of equilibrium. Deadweight loss rises as market price and quantity move away from equilibrium.



Underproduction and Overproduction

r 12-10 s a s a o s o o s r s r l s a ro r s r l s ar o a . ro o o la a s r a ol o oly, or a l , r o l r s a o $ 0 a ro o o l l ss a allo a-y r r s. a r o $ 0, o ly Q_1 la a s ar ro . $ 0 r a r o la a s, r s a r ro o or o o r so r s allo a o ro o o la a s. o o s all s r o o o s r s r l s a ro r s r l s a **deadweight loss**. $ 0 r a r o la a s, ar al s lar r a ar al os , s - all a o s rs al la a s or a o r al r a oo s a a ro s ar s.

DEADWEIGHT LOSS The loss of consumer surplus and producer surplus when output is either below or above its efficient level.

o a a r s lo l r , a s ro o yo Q*, o s r s r l s a ro r s r l s ll also o a . o r o Q* r s a o rallo a o o r so r s, or ar al os o ro la a s s r a r a ar al s, a o s rs o o al la a s as as o r ro s a o l ro s ar s.

o s r s r l s a ro r s r l s, alo a loss, allo o o s s o as ly as r rs a los rs ar s. a or a ro o- o l l, y a s o l s l ol y.

The LAST word

ON THE PATH TO THE PERSONAL COMPUTER AND INTERNET

Technological advance is clearly evident in the development of the modern personal computer and the emergence of the Internet. Here is a brief history of those events.

1945 Grace Murray Hopper finds a dead moth between relay contacts in the experimental Mark II computer at Harvard University. Whenever the computer subsequently malfunctions, workers set out to debug the device.

1946 ENIAC is revealed. It is a precursor to the modern-day computer that relies on 18,000 vacuum tubes and fills 765 cubic metres of space.

1947 AT&T scientists invent the transfer resistance device, later known as the transistor. It replaces the less reliable vacuum tubes in computers.

1961 Bob Noyce (who later founded Intel Corporation) and Jack Kilby invent the first integrated circuit, which miniaturizes electronic circuitry onto a single silicon chip.

1964 IBM introduces the System/360 computer. Configured as a system, it takes up nearly the same space as two tennis courts.

1965 Digital Equipment Corporation unveils its PDP-8, the first relatively small-sized computer (a minicomputer).

1969 A networking system called ARPANET is born; it is the beginning of the Internet.

1971 Intel introduces its 4004 processor (a microprocessor). The $200 chip is the size of a thumbnail and has as much computing capability as the 1946 ENIAC.

1975 Xerox markets Alto, the first personal computer (a microcomputer). Bill Gates and Paul Allen found Microsoft. MITS Corporation's Altair 8800 arrives on the scene. It contains Intel's 8080 microprocessor that Intel developed a year earlier to control traffic lights.

1977 Apple II, Commodore's PET, and Tandy Radio Shack TRS-80 go on sale, setting the stage for the personal computer revolution.

1981 IBM enters the market with its personal computer powered by the Intel 8800 chip and operated by the Microsoft Disc Operating System (MS-DOS). Osborne Computer markets the Osborne 1, the first self-contained microcomputer, but within two years the firm declares bankruptcy. Logitech commercializes the X-Y Position Indicator for a Display System, invented earlier by Douglas Engelbart in a government-funded research lab. Someone dubs it a computer mouse because it appears to have a tail.

1982 Compaq Computer clones the IBM machines; others do the same. Eventually Compaq becomes the leading seller of personal computers.

1984 Apple introduces its Macintosh computer, with its user-friendly icons, attached mouse, and preloaded software. College student Michael Dell founds Dell Computers, which builds personal computers and sells them through mail order. IBM, Sears Roebuck, and CBS team up to launch Prodigy Services, the first online computer business.

1985 Microsoft releases its Windows graphical user interface operating system that improves on MS-DOS. Ted Waitt starts a mail-order personal computer business (Gateway 2000) out of his South Dakota barn.

1990 Microsoft introduces Windows 3.0 which, like Macintosh, features windows, icons, and pull-down menus. Apple sues Microsoft for copyright infringement.

1991 The World Wide Web (an Internet system) is invented.

1993 Intel introduces its first of several Pentium chips, which greatly speed up computing. The courts reject Apple's claim that Microsoft violated its copyrights on its Macintosh operating system.

1994 Marc Andreessen starts up Netscape Communications and markets Netscape Navigator, which quickly becomes the leading software browser for the emerging Internet. David Filo and Jerry Yang develop Yahoo, a system for locating material stored on the Internet.

1995 Microsoft releases Windows 95 operating system, which becomes the dominant operating system of personal computers (90 percent market share). Microsoft is now well established as the world's leading software producer. Sun Microsystems introduces Java, an Internet programming language.

1996 Playing catch-up with Netscape, Microsoft develops Microsoft Internet Explorer and gives it away free.

1999 Netscape's market share plunges and it merges with American Online. More than 100 million personal computers are manufactured worldwide in this year alone.

2000 A federal court rules that Microsoft is an abusive monopoly and orders it broken into two companies, one that sells is operating system and another that sells its applications. Microsoft appeals the case to a higher court. Half of American households are online and the Internet emerges as a major technological revolution worldwide. Internet commerce in the United States reaches $300 billion and an estimated 1.2 million U.S. jobs are Internet-related.

Source: Based partly on Diedtra Henderson, "Moore's Law Still Reigns," *Seattle Times*, Nov. 24, 1996. Augmented and updated.

CHAPTER SUMMARY

1. Technological advance is evidenced by new and improved goods and services and new and improved production or distribution processes. In economists' models, technological advance occurs only in the *very long run*.
2. *Invention* is the discovery of a product or process through the use of imagination, ingenuity, and experimentation. *Innovation* is the first successful commercial introduction of a new product, the first use of a new method, or the creation of a new form of business enterprise. *Diffusion* is the spread of an earlier innovation among competing firms. Firms channel a majority of their R&D expenditures to innovation and imitation, rather than to basic scientific research and invention.
3. Historically, most economists viewed technological advance as a random, external force to which the economy adjusted. Many contemporary economists see technological advance as occurring in response to profit incentives within the economy and thus as an integral part of capitalism.
4. Entrepreneurs and other innovators try to anticipate the future. They play a central role in technological advance by initiating changes in products and processes. Entrepreneurs often form start-up firms that focus on creating and introducing new products. Sometimes, innovators work in the R&D labs of major corporations. Entrepreneurs and innovative firms often rely heavily on the basic research done by university and government scientists.
5. A firm's optimal amount of R&D spending occurs where its expected return (marginal benefit) from R&D equals its interest-rate cost of funds (marginal cost) to finance R&D. Entrepreneurs and firms use several sources to finance R&D, including (a) bank loans, (b) bonds, (c) venture capital (funds lent in return for a share of the profits if the business succeeds), (d) undistributed corporate profits (retained earnings), and (e) personal savings.
6. *Product innovation*, the introduction of new products, succeeds when it provides consumers with higher marginal utility per

dollar spent than existing products do. The new product enables consumers to obtain greater total utility from a given income. From the firm's perspective, product innovation increases net revenue sufficiently to yield a positive rate of return on the R&D spending that produced the innovation.

7. *Process innovation* can lower a firm's production costs by improving its internal production techniques. Such improvement increases the firm's total product, thereby lowering its average total cost and increasing its profit. The added profit provides a positive rate of return on the R&D spending that produced the process innovation.
8. *Imitation* poses a potential problem for innovators, since it threatens their returns on R&D expenditures. Some dominant firms use a fast-second strategy, letting smaller firms initiate new products and then quickly imitating the successes. Nevertheless, significant protections and potential benefits go to firms that take the lead with R&D and innovation, including (a) patent protection, (b) copyrights and trademarks, (c) lasting brand-name recognition, (d) benefits from trade secrets and learning by doing, (e) high economic profits during the time lag between a product's introduction and its imitation, and (f) the possibility of lucrative buyout offers from larger firms.
9. Each of the four basic market structures has potential strengths and weaknesses regarding the likelihood of R&D and innovation. The *inverted-U theory* holds that a firm's R&D spending as a percentage of its sales rises with its industry four-firm concentration ratio, reaches a peak at a 50 percent concentration ratio, and then declines as concentration increases further. Empirical evidence is not clear-cut but lends general support to this theory. For any specific industry, however, the technological opportunities that are available may count more than market structure in determining R&D spending and innovation.
10. In general, technological advance enhances both productive and allocative efficiency. But in some situations patents and the advantages of being first with an innovation can increase monopoly power. While in some cases *creative destruction* eventually destroys monopoly, most economists doubt that this process is either automatic or inevitable.
11. Consumer surplus is the difference between what a consumer is willing to pay for an additional unit of a product or service and its market price. Producer surplus is the difference producers receive for a product or service less the marginal cost of producing it. Efficiency in a market is realized when the sum of consumer surplus and producer surplus is maximized. Reductions in consumer surplus and producer surplus from their maximums is referred to as deadweight loss.

TERMS AND CONCEPTS

technological advance, p. 305
very long run, p. 305
invention, p. 305
patent, p. 305
innovation, p. 305
product innovation, p. 306
process innovation, p. 306
diffusion, p. 306
start-ups, p. 308
venture capital, p. 310
interest-rate cost-of-funds curve, p. 310
expected-rate-of-return curve, p. 311
optimal amount of R&D, p. 312
imitation problem, p. 316
fast-second strategy, p. 317
inverted-U theory of R&D, p. 321
creative destruction, p. 323
consumer surplus, p. 325
producer surplus, p. 326
deadweight loss, p. 328

STUDY QUESTIONS

1. What is meant by technological advance, as broadly defined? How does technological advance enter into the definition of the very long run? Which of the following are examples of technological advance, and which are not: an improved production process; entry of a firm into a profitable purely competitive industry; the imitation of a new production process by another firm; an increase in a firm's advertising expenditures?

2. Listed below are several possible actions by firms. Write INV beside those that reflect invention, INN beside those that reflect innovation, and DIF beside those that reflect diffusion.
   - **a.** An auto manufacturer adds heated seats as a standard feature in its luxury cars to keep pace with a rival firm whose luxury cars already have this feature.
   - **b.** A television production company pioneers the first music video channel.
   - **c.** A firm develops and patents a working model of a self-erasing whiteboard for classrooms.
   - **d.** A light bulb firm is the first to produce and market lighting fixtures with halogen lamps.
   - **e.** A rival toy maker introduces a new Jenny doll to compete with Mattel's Barbie doll.
3. Contrast the older and modern views of technological advance as they relate to the economy. What is the role of entrepreneurs and other innovators in technological advance? How does research by universities and government affect innovators and technological advance? Why do you think some university researchers are becoming more like entrepreneurs and less like pure scientists?
4. **KEY QUESTION** Suppose a firm expects that a $20 million expenditure on R&D will result in a new product that will increase its revenue by a total of $30 million one year from now. The firm estimates that the production cost of the new product will be $29 million.
   - **a.** What is the expected rate of return on this R&D expenditure?
   - **b.** Suppose the firm can get a bank loan at 6 percent interest to finance its $20 million R&D project. Will the firm undertake the project? Explain why or why not.
   - **c.** Now suppose the interest-rate cost of borrowing, in effect, falls to 4 percent because the firm decides to use its own retained earnings to finance the R&D. Will this lower interest rate change the firm's R&D decision? Explain.
5. **KEY QUESTION** Answer the lettered questions in the next column on the basis of the information in this table:

Amount of R&D, millions	Expected rate of return on R&D, %
$10	16
$20	14
$30	12
$40	10
$50	8
$60	6

   - **a.** If the interest-rate cost of funds is 8 percent, what will be the optimal amount of R&D spending for this firm?
   - **b.** Explain why $20 million of R&D spending will not be optimal.
   - **c.** Why won't $60 million be optimal either?
6. **KEY QUESTION** Refer to Table 12-1 and suppose the price of new product C is $2 instead of $4. How does this affect the optimal combination of products A, B, and C for the person represented by the data? Explain: "The success of a new product depends not only on its marginal utility but also on its price."
7. Learning how to use software takes time. So once customers have learned to use a particular software package, it is easier to sell them software upgrades than to convince them to switch to new software. What implications does this have for expected rates of return on R&D spending for software firms developing upgrades versus firms developing imitative products?
8. **KEY QUESTION** Answer the following questions on the basis of this information for a single firm: total cost of capital = $1000; price paid for labour = $12 per labour unit; price paid for raw materials = $4 per raw-material unit.
   - **a.** Suppose the firm can produce 5000 units of output by combining its fixed capital with 100 units of labour and 450 units of raw materials. What are the total cost and average total cost of producing the 5000 units of output?
   - **b.** Now assume the firm improves its production process so that it can produce 6000 units of output by combining its fixed capital with 100 units of labour and 450 units of raw materials. What are the total cost and average cost of producing the 6000 units of output?

c. Refer to your answers to 8a and 8b and explain how process innovation can improve economic efficiency.

9. Why might a firm making a large economic profit from its existing product employ a fast-second strategy in relationship to new or improved products? What risks does it run in pursuing this strategy? What incentive does a firm have to engage in R&D when rivals can imitate its new product?

10. Do you think the overall level of R&D would increase or decrease over the next 20 to 30 years if the lengths of new patents were extended from 17 years to, say, forever? What if the duration were reduced from 17 years to, say, 3 years?

11. Make a case that neither pure competition nor pure monopoly is conducive to a great deal of R&D spending and innovation. Why might oligopoly be more favourable to R&D spending and innovation than either pure competition or pure monopoly? What is the inverted-U theory and how does it relate to your answers to these questions?

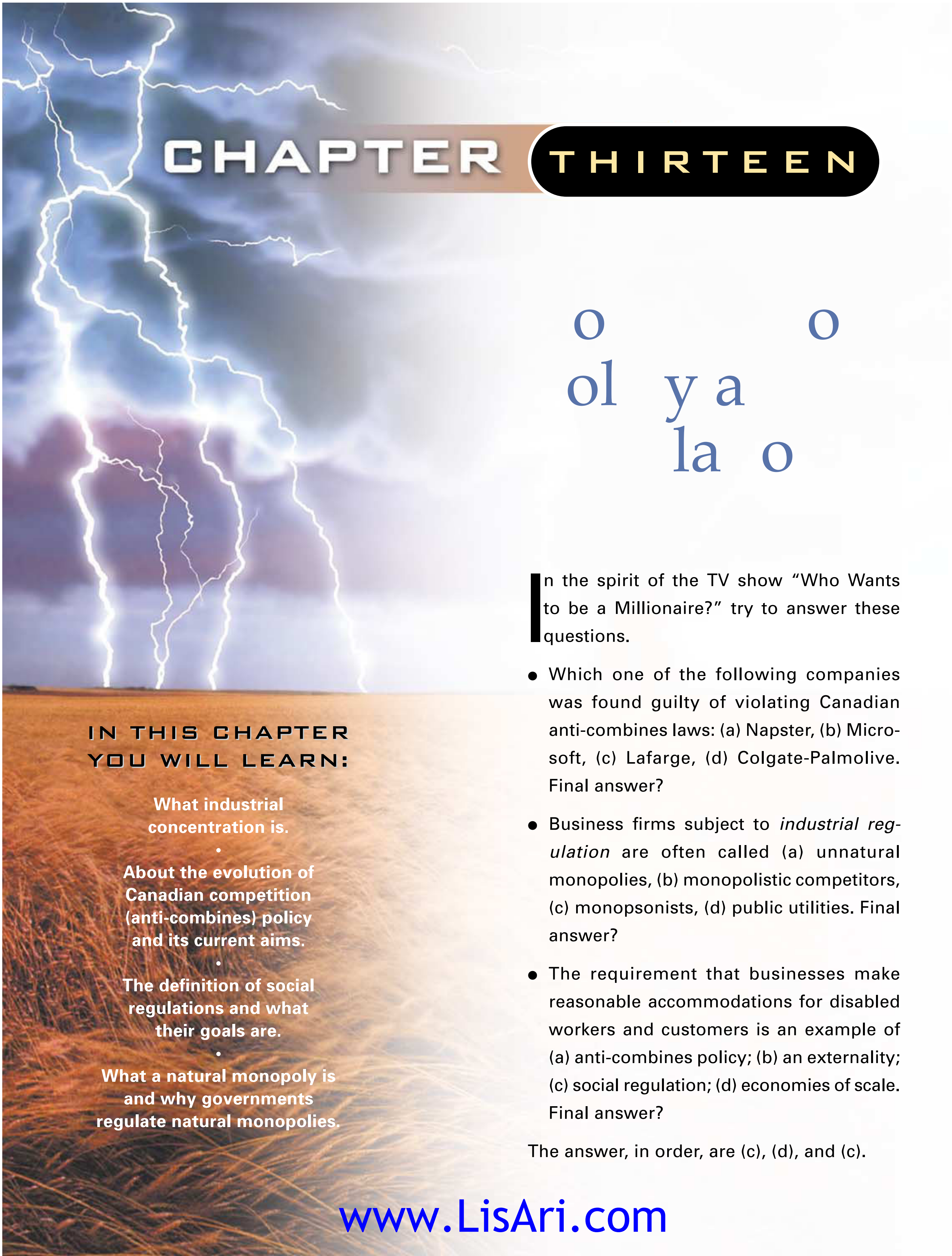
12. Evaluate: "Society does not need laws outlawing monopolization and monopoly. Inevitably, monopoly causes its own self-destruction, since its high profit is the lure for other firms or entrepreneurs to develop substitute products."

13. Distinguish between consumer surplus and producer surplus. What is deadweight loss and how does it relate to consumer surplus and producer surplus?

14. **(The Last Word)** Identify a specific example of each of the following in "The Last Word": (a) entrepreneurship, (b) invention, (c) innovation, and (d) diffusion.

INTERNET APPLICATION QUESTION

1. Visit NASA's Technology Transfer Office <www.sti.nasa.gov/tto> to determine where significant commercial benefits have been realized from secondary use of NASA technology. Are there any that have been inconsequential? How does the NASA Commercial Technology Network <nctn.hq.nasa.gov/> move technology from the lab to the marketplace?



CHAPTER THIRTEEN

o o
ol y a
la o

IN THIS CHAPTER YOU WILL LEARN:

What industrial concentration is.

•

About the evolution of Canadian competition (anti-combines) policy and its current aims.

•

The definition of social regulations and what their goals are.

•

What a natural monopoly is and why governments regulate natural monopolies.

In the spirit of the TV show "Who Wants to be a Millionaire?" try to answer these questions.

- Which one of the following companies was found guilty of violating Canadian anti-combines laws: (a) Napster, (b) Microsoft, (c) Lafarge, (d) Colgate-Palmolive. Final answer?
- Business firms subject to *industrial regulation* are often called (a) unnatural monopolies, (b) monopolistic competitors, (c) monopsonists, (d) public utilities. Final answer?
- The requirement that businesses make reasonable accommodations for disabled workers and customers is an example of (a) anti-combines policy; (b) an externality; (c) social regulation; (d) economies of scale. Final answer?

The answer, in order, are (c), (d), and (c).

s a r loo a r s so o r ol s o ar s ss a - o s ol y, s r al r la o , a so al r la o . - o s ol y o s s s o la s a o r a o s s o r o o oly a ro- o o o . s r al r la o o s s s o o r r la o o r s' r s (or ra s) s l s r s. o al r la o s o r r la- o o o o s r oo s ar ro , ys al ara r s s o oo s, a a o ro o a o s o o oo s o so y.

DEFINITION OF INDUSTRIAL CONCENTRATION

a r 10 lo a a l a s r o o o o oly. *e mono ol* , sa , s a o - r s ry a s a o r y a ro s ro r ly y a s l r a ry o s ry s o ally lo . s a r ll s r *ind ial concen a ion* o l r o o oly a ar s o al o o oly o r s s. s r al o ra o o rs r a s l r or a s all r o r s o rol a or or o o o o a s ry. , o, or r r s o a s ry, o ally r s l r- a - o r s a ro s. s o , s los r o o ral l rs a s o o oly ro l , l s a y s r s a r o sly s a as ol o ol s. s r al o ra o s a r s r rs o s r s r s ar lar a sol r s a r la o o o al ar . a l s ar l - o s ry, or l, lar y a y s a ar , o a s ar a o o l s ry, r G ral o ors o a a a, or o a a a, a a l r rysl r a a a ar o a al s ry, o a y ro- a a a, r al l (o), a ll a a a al s ry, r s r al a l a l r s s r a s l s ry, r o lar ro rs, o as o, or rly o o o r s & l, a l o, or rly l o a y o a a a, o a l o 's s ar o ar .

THE ANTI-COMBINES LAWS

The Role of Governments

ANTI-COMBINES POLICY The laws and government actions designed to prevent monopoly and promote competition.

rly r os o **anti-combines policy** (a o o oly ol y) s o r - s r al o ra o or o o ol a o , o ro o o o , a o a allo a y. l o all o o s s o l a r a s ar r or o s oals, o o o s s a o ss o a a a a - o s ol y. s ll s , a - o s ol y o r y ars as r l ar- or o s s .

Historical Background

a o o ra o 1 , lo al ar s a o o a o al ar s a s o ro ra s or a o a l s, a ro- o o s, a so s a or ora s r r s. 1 0s a 1 0s ar- ls r s ral s r s, l o o l , sal , , o r, a a a , a o a o s r s. r s o s s o a l a s o o o ol s s r s a ar o o oly r s o s o rs a ra r o ss o s ro r so r s l rs. ar rs a o rs o s all s ss s r ar larly l ra l o o r o lar or ora o o ol s a r a o rs o o os . o s rs, la o r o s, a o o s s r o ar r o os o .

a o o as a a s o o oly s a l ar o yo ro a r 10. o o ol s s o ro l ss o a ar r r s a r s r s r o . r o o , ro o o rs r *P* . s al y r r s s a allo a o o r so r s a s *P* as r s ar al o so y o a ra o o , l ar al os r s os o a ra . *P* , so y a o a y ro o or or o l ss o ro . o ras , a o o ol s a s ro y a ar al r (o r) ar al os . s o , r s ar al os , a a so y o l o a or a o l r os y ro ra s. r s a rallo a o o r so r s o o o ol ro , a so o o ll- o so y s l ss a o l r a r o o .

Go r o l la ry a ar or s o o ol s r s o ro s o rol o ro o s rs, a a r o o , a a allo a y. o, s o al r a a s o o rol as s s s or, or s l s o, ar or s.

ANTI-COMBINES (ANTI-MONOPOLY) LEGISLATION Laws designed to prevent the growth of monopoly.

- ***Regulatory agencies*** ar s r a r o ro or olo y r a s a *na al mono ol* , o r s a l s l r - la ory a s o o rol o o a o r.
- ***Anti-combines laws*** os o r ar s, so al o rol oo or o **anti-combines (antimonopoly) legislation** s o or r ro o o o oly.

ll s or ly r a - o s l sla o a , as r a y ar o s a s, o s s as la o la r s o or- ora s a o ra o . or o, l ’s a r r y s.

<www.iln.com/articles/canada.html#12> Foreign investment and anti-combines law

Merger Types

r as y s o r rs a o r, as r r s r 1 -1. s r s o s o s a s o ro o , o s a , o r al- oo s a o o s al- oo s r s a os a l a s. a r a l (, , , ,) r r s s a ar lar r .

HORIZONTAL MERGER A merger between two competitors selling similar products in the same market.

horizontal merger s a r r o o ors s ll s lar ro - s sa ar . r 1 -1 s y o r r s s o as a o a- o o lass ro rs a . a l s o or o al r rs o l yo o a o s y ars a r a a a’s r r a a a rl s.

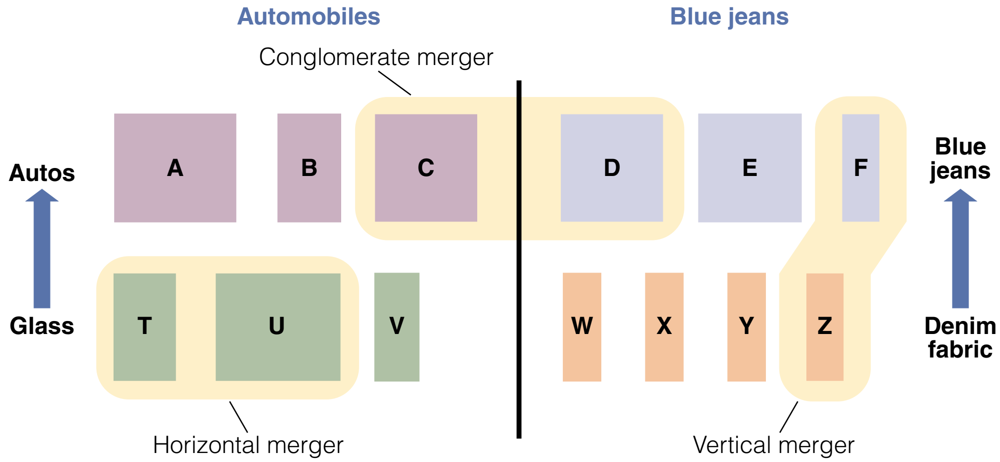
VERTICAL MERGER The merger of firms engaged in different stages of production process of a final product.

vertical merger s a r r r s a r s a s o ro o ro ss. r 1 -1 r r r , a a r ro r, a r , a l a s ro r, s a r al r r. r al r rs ol r s a y r s ll r r la o s s. a l s o r rs o s y ar s o’s r rs a , a o ll, a y r . s o s l s so r s o a o s as - oo o l s.

CONGLOMERATE MERGER The merger of a firm in one industry with a firm in another industry or region.

conglomerate merger s o ally as a y r r a s o or o al or r al ral, s o a o o r s r s r s or r s o r- a r o ra al ar as. o lo ra r rs a l o ro s sol , or o o ally r la o a s. r 1 -1, r r r , a a o a a r r, a r , a l a s ro r, s a o - lo ra r r. r al- orl a l o a o lo ra s o r or ora o o a a a, a ar r o r al. o s ol s ar Gr a - s o., .,

FIGURE 13-1 TYPES OF MERGERS



Horizontal mergers (T + U) bring together firms selling the same product in the same geographical market; vertical mergers (F + Z) connect firms having a buyer–seller relationship; and conglomerate mergers (C + D) join firms in different industries or firms operating in different geographical areas.

a l s ra s s ary, a o r roa as ., a s s ary a o s sa rs a ra o s a o s. ro , o r or ora o as s s a or o a o s, s r al, r y, l y, a al s r s, a oo o a s. o r o loo a ol o o a - o s l sla o a a a.

The Evolution of Anti-Combines Legislation

THE ACT OF 1889

a a a a - o s l sla o a 1 assa o a a a a *mi demeano* o o s r o r s r r ra , o , or o o . r y ars la r, o 1 a a s o o r al o a o a a a l o . rs y ars o ry r r s ros o s r s o , r s l o r o o s. r - o a o o r r al o as ar larly l , a r r a s a ssary.

COMBINES INVESTIGATION ACT, 1910

COMBINES INVESTIGATION ACT The Act, in 1910, that authorized a judge, on receiving an application by six people, to order an investigation into an alleged combine; became the Competition Act in 1986.

r s l as ass o **Combines Investigation Act** 1 10, a os a as a 1 , a o o . 1 10 a or a , o r a a l a o y s rso s, o or r a s - a o o a all o .

1 10 as s ss l or o r aso s (1) rar ly o l s r a - s o ll o ar l y a s o a a s a- o (2) a s a o , a or r y a , s ar a r s o rso or o y a s r o o sly. s, r as o ly o s- a o r or orl ar .

0 y ars sa o a al a . o r 1 2 a - s o , s l s o o s o ss o r a ass o o s ara a s o or s a o a r s ar , o r or a ra sal a r or . s r s a l s a r or o s a o a r s ar

a a s r ra ra s o ss o , la r s rs 1 y o o r al (s lo).

1 0, o s s a o as a las a o l ro-s o s r la o o a o s a a la o r al o s 1 2. s ll, r rs a o o ol s o r la l o ly a r or a a s r s o l .

1 , ly or ar o o s r a or ora a rs oo o r r s o s l y or o s, r rs, o o ol s, a r s ra o ra . or ly r a r, 1 , o o o l o a a a r or a ro-s o s o o s s a o a r rs a o o ol s r -al o s r all o ra a s a r al o a o ro yo as a o o a o a ry l as . o r, o o o -l *no* r o arr rs la ay o a o a y a o -a ro r al ro or s r or y. o o o l’s ol a roa as as o oal o o o y. as s sa a roa a l o o o l o r o a o o ol y o s r s.

a ary 1, 1 , a s o o s s a o a , r s l a a a l a l o s r s as ll.

THE COMPETITION ACT, 1986

ss o r s a a a a o r a o a s o a a a’s la o r o o ol s. r a s, lls ro or arl a-1 1, 1 , a 1 , o os o ro s ss. s o-s l a o s r a s or a ro al o r s r ro o o y a o r ll 1 . 1 l o r a s ll, oo, as r a .

ally, 1 , arl a ass o o r al a **Competition Act**, la r a or o s s a o . o o a or a s ar or o .

COMPETITION ACT The Act that replaced the Combines Investigation Act in 1986.

COMPETITION TRIBUNAL A government body that adjudicates under a civil law framework that permits the issuing of remedial orders to restore and maintain competition in the market.

Civil Law Framework o ar s r r s (o o oly a ol o oly) a o s r ral a (r r) o o r r s o o l la , a as r o ros os r rs a o o ol s o l r s . o a o r, s as r , s s ll a l y r lar o r s, r s a ar o s yo a r aso a l o a al s ar ars . **competition tribunal** a a s r a l la ra -or a r s ss o r al or rs o r s or a a a o -o ar . r al s a o s o ral o r a lay rso s, a as a r rso . s r ra ra s o s-s o as a ol s as a r s l .

o a o al o s a a . o o o s o r ly a a o o oly o s ro a 100 r o ar . a s o a o o oly os o a a a .

<canada.justice.gc.ca/en/laws/C-36.4/index.html>
Competition Tribunal Act (R.S. 1985, c. 19 [2nd Supp.])

Recent Cases

o o s s o a o o y a o a a a l o a ar o o s a r a o al ra . ly os r rs r s l-a a a l l ss o o o a ro or o y o o r al. r rs a r s l y a s ro a r o o s o s al a rally allo .

o o r a r o allo r ro r a a a a a a a rl s 1 , ro ral o r o a a- a ar o or o o . a a a rl s as a al l y a as o l a o l s r o so . a sa or r r o r a a a a a a a rl so y ro s, o r s s a o l a o ar o ra o l ss ral o r s o rs so- all o s s ol y.

o o r a r o a a s ar r a r rs 1 , oyal a o a a a a a o o r al a o r o o r . oo a r, a a a r al a o o r a oro o o - o a also o r . a s ar a y o r o a - r o o so s al a a l o o r a o ally. o o r a as o o y a s' ar , ars a o o o l r a ly r a l s all r r s or o o s rs a s all a -s r s. r a o a or or a s r allo o o a a a ar , lar s a l s or o ra s y a a a a s ro a lar arr r o ry or a y o or. oyal a o a a a a a o o r al r , o r, s ss l r r r ar o ra o s.

<strategis.ic.gc.ca/SSG/ct01250e.html>
Competition Bureau

Issues of Enforcement: Tradeoffs among Goals

ro o o o so ly o o so y's oals a s r or o a - o s la s ay so s o so o r oal. r ar o a l s.

BALANCE OF TRADE

Go r s s ays o r as or s o ay or or s. - o s a o s a o a r r o al s l rs, or ssol a ro or so ar o o ol s , a ar r , r y r s o - ss a sal s a roa . o s ly, a a a or s l a s r a or r as a o 's ra . o l o r s r ly or a - o s la s, s a a o s o a a a or s ar a s a r s o l a - o s oal o y s rs y oal o ala or s a or s

EMERGING NEW TECHNOLOGIES

as o ally, olo s o o r a ro s a s r s. r- r a l s s o o r a o a o s olo s r la - o r . s ra or as ro o a o s a a l s o o s ol s, s ss s, a o r s a ross lo . also a l s o l o a ss r a o s o or a o a r ly y a s ll oo s a s r s. r o s olo y as s o a s a o a r rs a o r a o a s, l o a o o - a s, o r a a r rs, a so ar ro rs. o l o r s r ly or a - o s la s o lo so o os r rs, s ally o s a ro o a r s a r a or o - o r s o l o r orar ly s s a - o s r l s o o ra r s r r o s r s a s a s o o s - olo y as a a o r -r la olo s also r as a a a or s o l ro s r s. a o s or ra o s, y s l , r rs o ro rsy. o ar a a s ro a a - o s ol y s a a s s o ol y o o o s. rs o a s l or o a - o s la s a ro sly r r s ar ro ss. o sly, - r ol y a rs a r a s ra o s ay s o s ra o s a ra o s r ly. (*Key Question 2 and 3*)

QUICK REVIEW

- Industrial concentration exists where a single firm or a small number of firms control the major portion of an industry's output.
- Three types of mergers can occur: horizontal, vertical, and conglomerate.
- The first Canadian anti-combines legislation was passed in 1889. Its purpose was to make it unlawful to restrict competition unduly.
- The original anti-combines legislation subsequently came under the Criminal Code, making successful prosecution difficult.
- The Competition Act, passed in 1986, removed anti-combines activity from the Criminal Code, making prosecution easier. This Act also stressed that even if some mergers lessen competition, they should be allowed if such mergers bring about significant efficiency gains.

INDUSTRIAL REGULATION

KEY CONCEPTS The Role of Governments

- o s ol y ass s a so y ll o o oly s r ro ol or s ssol r alr a y s. o r r o a s al s a o a o o r aso s s or a s ry o or a o o ol s ally.

Natural Monopoly

natural monopoly s s o o s o s al ar so s a a s l r a s ly r ar a a lo r os a o l a ro o - r s. l ar- r s a s o a ral o o oly ar r la ly rar , s o o s s or a y *blic ili ie* , s as lo al l r y, a r, a a - ral as. s s ss a r 10, lar -s al o ra o s so as s ar ssary o o a lo os s a a lo ro r . r a ral o o - oly s s, o o s o o al. ar r a o a y ro rs, o o s o s al o l o a a os s a r s o l r a ssary.

r ar o oss l al r a s or ro o r o o o o s r a ral o o oly s s. s l o rs , a o r s l r la o .

P blic o ne hi or so a ro a o o as s a l s a s a s, s as a a a os a a a o al l l a ass ra s , a r s ly sys s, a ar a oll o a lo al l l. *blic eg la ion*, or a o o s s all s r al r la o , as r rr o o a a a. s y o r la o , o r o ss o s r la r s (s ally all ra s) ar y a ral o o ol s s. a l 1 -1 l s s a or ral r la ory o ss o s a r r s o s.

o o o o s r al r la o s o **public interest theory of regulation**. or o a ory, s r al r la o s ssary o a a ral o o oly ro ar o o oly r s a s ar o - s rs a so y. oal o s r la o s o ar r or so y a l as ar

NATURAL MONOPOLY An industry in which economies of scale are so extensive that a single firm can supply the entire market at a lower unit cost than could a number of competing firms.

PUBLIC INTEREST THEORY OF REGULATION The theory that industrial regulation is necessary to keep a natural monopoly from charging monopoly prices and thus harming consumers and society.

TABLE 13-1 THE MAIN FEDERAL REGULATORY AGENCIES

Atomic Energy Control Board
Canadian Dairy Commission
Canadian Grain Commission
Canadian Radio-Television and Telecommunications Commission
Canadian Wheat Board
National Energy Board
National Farm Products Marketing Council
National Harbours Board
National Transport Agency of Canada

o os r o s asso a a ral o o oly l a o r s r o s o o a r s a o r - la o o oly. o o s a ro r a or ra al, so y s o l allo or o ra a o o oly r la s r s. la o s o l s r r so a ra ay rs ro o o s o s al lo r r- os s a a ral o o ols s ar a l o a . ra , r la ors s o s a l s ra s a ll o r ro o os s a y l a a r r r o r r s . oal s o s r al o a ra o al os , so a r la r r s a or al ro , as s r la o o oly s o o a r 10. ar lar, yo s o l ar lly r - r 10- .

Problems with Industrial Regulation

o s ra l sa r ra s o r ss o s r al r la o . ’s a o r s s.

COSTS AND INEFFICIENCY

r la r as a s ro o r s os s a a l l o o - , a s a ll r as s ro . r la ory o ss o , o r, o - s r la r o a or al ro or a a r r r o al o s ass s. a r la r lo rs s o ra os s, r r s ro ally ll l a r la ory o ss o o r r r o lo r s ra s a r r s ro - s o or al. r la r , r or , as l l or o o r s o ra os s.

ors y , r os s o o r s l lo r ro . a s r la ory o - ss o s s allo l l y a a r r r , r la o o ols s a s ly ass ro r ro o os s o o s rs y ar r ra s. r la r ay r aso a as ll a salar s or s or rs, o l or o o s or a a , a l , s r r s sa r a r s r os s ar or o . o, al o a a - ral o o oly r s os ro o o s o s al , s r al r la o os rs o s ra l - y (r 10-). a s o a s o o o , o al os sa s ro a ral o o oly ay r a ally a r al .

PERPETUATING MONOPOLY

s o ral ro l s r al r la o s a so s r - a s o o oly lo a r o o s o a ral o o oly a a ora . olo al a o r a s o al or o o a l as so or all or o s o r la s ry, s as r s a o ra lroa s ra s ss o o o a a a y ro a a sa ll s a o - ra s ss o o r l o r s sa ll l s o a o a l l s o , a ll o s a o r lar o s. , s rr y r s y r la a l a r la r s ar a ral o o ol s, o ss o s o ro r la r s ro o o y r lo ry or r la o o o ors. ra o al s ally s a o ors s ly a o s r a ro s l ly ro a l or o s o r la s ry o o a o o r rsal s r r r o r la r . y los ly ro a l or o o r s- ss, r la r s o l a o r as ra s or s r s a o o ay r o ay o o o r a a r ra o r r o r ass s. r r la ors lo ry or r la o o o r s, s r al r la o ay r a a o o oly a s o lo r a a ral o o oly a a o l o r s ro . r ary o o oly, ro y o- r , ay s la a ral o o oly. so, r la r s ay r a y o l o o . ar s o o a r - la o s ar r la r s, r loy s, a r a s o s rs o so s r s. los rs ar all o r o s rs a o al o ors o ar arr ro r s ry. (*Key Question 8*)

Legal Cartel Theory

LEGAL CARTEL THEORY OF REGULATION
The hypothesis that some industries seek regulation or want to maintain regulation so that they may form a legal cartel.

r la o o o ally o s r s as ro **legal cartel theory of regulation**. la o so ally o als or r la o o a- ral o o ol s o ro o s rs, ol rs o s s ra al ol a s as s ly r la o o lo al, r o al, a a o al r s a ar a o o o o r ro s or o r lo - r s r al. s r s s r r la o a s y l s a l al o o oly a a ara a ro . - ally, r la ory o ss o r or s s o s as lo ry (or a l , lo al l o s r), or, r r ar s ral r s, o s- s o s ar l a ll al ar l (or a l , or a rl r la o , ral o r ass ro s o s a rl s). o - ss o ay also r s r o al o o y lar ar l. l o r a ar ls ar ll al, s a l , a o r a o , s al a ra o o a o r -s o sor ar l r s o r la o s a r s. l al ar l ory o r la o s s s a r la o r s l s ro r -s a s o r a r s a s r o ol a s o r s o s . a o al l s s a la o r- ar a l a o o l al ar l ory. r a o a o al ro ar rs, s s, a rs yl s s, r or s rs, - a s, la y rs a s r l s o ro s a ro s - l ro arla a s a a s, s s say r al r aso ay o l ry o o a o al ro so a ra o rs a r o o oly o s. s o s r r s o s s s a ar s y o a , o r s al, al s r a o 1 r r a s o 10 r r ar as os r s r l s la s. al y o s ry a ar ly as o a .[1]

<csgb.ubc.ca/ccpp/>
Canadian competition policy

DEREGULATION

1 0s, l al ar l ory, o y r la s r s, a o o a o r as r la o ally

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[1] Morris Kleiner and Robert Kudrie, "Does Regulation Affect Economic Outcomes? The Case of Dentistry," *Journal of Law and Economics*, October 2000, pp. 547–582.

o s r s all o r o a a o r la o . , arl a- a so ro al l sla r s a ass l sla o a as r la ary r s a rl , r , a , ra lroa , a ral as, l r y, a l s o roa as s r s. r la o as also o rr l o a o s s ry. ll a a a o o s o r arr rs, s as r , lo al a lo - s a ar s. ll a a a also o s ll lar o a s. r la o 1 0s a 1 0s as o o os - s r s o o ol y o a la r as 0 y ars.

Controversy

r la o as o ro rs al, a a r o o ro rsy as r a l . ro o s o r la o , as r ar s o ros o o a ral o o - oly a l al ar l ory, o a r la o o l lo r r s, r as o , a l a r a ra s.

o r s o r la o , ra o o a ral o o oly a l r s ory, ar a r la o o l r s l s r r ars a al r - o o ol a o o so o r la s r s y a s l r . y r r r s, s o , a r ora s r . r r s r o r a r la o o l l a o s ry s a l y a a al s r s (or a l , ra s or a o) o l ra ro s all r o s, l so s r ss a as r as o o r r s o a r , r s o l lo r r sa y s a ar s o r os s a r a ro a l .

Outcomes of Deregulation

l r ar s ll o r s o r la o , os o o s s l a r la o as l arly o s rs a o o y. or o s - s, r la o o or rly r la s r s s o o r r s o ll o s o ollars a ally o so y's ll- ro lo r r s, lo r os s, a r as o .[2] os o os a s ar a r r s r s a rl s, ra lroa s, a r . r ar s (a s or a o) a l y a o o - r , a a rl sa y as ro . r a ra lroa r ra s (a a , a s or a o) a ro y a o o - al . a - y a s a o rr lo - s a l o a o s, a sl - y a s a a a l l s o , s o ro ra s r s, a a ral as s ry. r la o as l as a a o olo al a a s a a r s l s a ro ro s a s r s as a a s, ll lar o s, r -o a l , ro a sys s o a- o s, a r .

s ss o as r la o as l o r r alls or r la o . la s s ry o r la o ro ss s l r y, l y l r a a ar o. r la o s o o rr a ol sal l l, r r s ar r o l ra a l s a s ll l r y a ar r s. ral o - r 's oal s or all o s rs o a a o a o o o r s - l rs y 2010.

<sanjose.bcentral.com/sanjose/stories/1998/01/19/editorial4.html> The United States can learn a few lessons on deregulation from Canada's moves

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[2] Clifford Winston, "Economic Deregulation: Days of Reckoning for Microeconomists," *Journal of Economic Literature*, September 1993, p. 1284; and Robert Crandall and Jerry Ellig, *Economic Deregulation and Consumer Choice*, Center for Market Processes, Fairfax, Virginia, 1997.

QUICK REVIEW

- Natural monopoly occurs where economies of scale are so extensive that only a single firm can produce the product at minimum average total cost.
- The public interest theory of regulation says that government must regulate natural monopolies to prevent abuses arising from monopoly power. Regulated firms, however, have less incentive than competitive firms to reduce costs; that is, regulated firms tend to be X-inefficient.
- The legal cartel theory of regulation suggests that some firms seek government regulation to reduce price competition and ensure stable profits.
- Deregulation initiated by government in the past three decades has yielded large annual efficiency gains for society.

SOCIAL REGULATION

The Role of Governments

SOCIAL REGULATION Government regulation of the conditions under which goods are produced, the physical characteristics of goods, and the impact of the production on society.

s r al r la o s ss r s o as o s o r - la o o r s (or ra s) a ral o o ol s. arly 1 0s, a y o r la o a o r . **Social regulation** s o r o o s r oo s a s r s ar ro , a o ro o o so y, a ys al al s o oo s s l s.

Distinguishing Features

o al r la o rs ro s r al r la o s ral ays. rs , so al r la o a l s o ar or r s a s r al r la o . o al r la o so a l a ross oar o all s r s a r ly a s or ro rs a o s s r al r la o . or s a , l s r al r la- o y r ra s or o o a o al ra s or y o a a a o rols o ly a r ra s or s ry, r l s a r la o s o a a a a o r (a y) o a s ro al o r ar s a ly o ry loy r. o , so al r la o r s o ay- o- ay ro o ro ss o a r a r a s r al r la o . l s r al r la o o s s o ra s, os s, a ro s, so al r la o o a s s o ro s, o o s o loy , a a r o ro o ro ss. s a l s, ra r a s y sa y s a ar s or l s, o or l a y l ss s a ar s l o or l a s a o s ss o . ally, so al r la o as a ra ly r sa r o s r al r la o as a . r s so al r la o , r s s ro r aso a l a o o a o s or al or rs a o a l a s sa l- s. lso, s ll rs s ro r aso a l a ss or s o rs sa l s. s o o r so y a a a a rly a s a ar o l y 1 0s, a o s o ro o a r al al y o l . a o s all or sa r ro s, l ss oll o , ro or o o s, a r a r al y o o o or y.

The Optimal Level of Social Regulation

l o o s s a r o or so al r la o , y sa r o r rr l l o s r la o s o al. all a a a y s o l a so lo as s ar al ( ) s s ar al os ( ).

o so al r la o s s , r s ool l so al r la o , , s , r s oo so al r la o . or a ly, ar al os s a s o so al r la o ar o al ays asy o as r a r or ay ll s . o, olo y a o ro r s a rol o o r o r s a o r so al r la o as as, or r a s or a , o o os a alys s.

IN SUPPORT OF SOCIAL REGULATION

rs o so al r la o say a as a o a l s ss s a , o r- all, as r a ly a so y's ll- . y o o a ro l s so al r la o o ro s ar s r o s a s s a al. o sa s o or rs a ally o -r la a s a ll o so or rs s r r s a or o ss a ay or or o or . r oll o o s o lo a or a a- a s, os lar os s r s o r ro r y al s a r as al ar s . ro s l r a a l s a y ar a s o oorly s or a a r ro s (or a l , ar r s) or a oo (or a l , *e-coli*). s r a o a a s so or s, rso s sa l s, a ol r or rs r s r ar s a os s a y os s o so y.

ro o s o so al r la o a o l a so al r la o s os ly, y orr ly o o a a r or so o s o ssar ly a a s o l o r as . y say a a ro r a o o s s o l o r os s o so al r la o ar or lo r - s o so al r la o os s. r a s o l , y r r ass r , so y a o o l a s ro , a sa y o or - la , a ro o o o o or y or all o rr s s a al os s. o s a s a o os s o so al r la o ar rr l a , say rs, s s ar r a r. l o r s a s os s, s y ar or l o as r a os s a o o a ar o ly a r so as ass (or a l , s o r lo al ar).

ro o s o so al r la o o o s a y s s. s s - a a ay a al s o l 0 r r a r a ally a s o a o sa y a r s a a ro r la o . o l a l sa y- s a a s a l la s as s a ly r a o a al y ra or s all l r . a o al a r al y s a ar s s y la a r a arly all ar s o a o or s l r o , ro o , a l a . s s l arly l l a r a r, o r s al, r as s al s o o s. loy y r la o s a r as la o r a or or s a al s. s o l roo l s as r s l a 0 r l l a s a s y a al s allo o o so o s s s a s.

o rs o so al r la o say a y ar as r a r a r r - la o o l ra s o so y. or a l , so all or r a r r la o o a , o l ry, a s a oo s r s o ro oo sa y. - rs say a or r la o s o s r a ol o s, s, a o a s ar o ar o l r .

o a s o so al r la o say a s o s r la o ar ll or o s ra l os s. os s ar s ly r s ay o r a a os a l , s s a a l , a s so y. (***Key Question 10***)

Criticisms of Social Regulation

r s o so al r la o o a , a y s a s, as a o o r ar al os s ar al s. s , so - y o l a s y a o l so so al r la o . r s say a a y so al r la o la s ar oorly r , a r la ory o s a s a ar s l o rs a . s ar s l , r la ors rs oals ll yo or al o l sla o . s ss s o la a r la- ors o r ss or a o al r s o ro , l o os s.

ally, o o s o so al r la o say a r la ory a s ay a ra o r alo s or rs o ar os l o ar ar sys a l oo r ly r la o . or a l , so ro a a a s a all ly s all oll o as a a all oll rs as a ys. y a a s o a o all o ry o y o al a o o oll o as o a ar l a alys s o ar al os s a ar al s.

Two Reminders

a o r ro r a o o so al r la o ll s r ly o . l a o ro o s a o o s o so al r la o r o o r rs.

THERE IS NO FREE LUNCH

o a , r s or rs o so al r la o o r r a r s o r l . o al r la o a ro r r s, s o a o , a r o o .

o al r la o ra s s ro r s o ays. o s so r ly a s o l a os s or ally ass o o o s rs, a o s so r ly y r la o r ro y. so r s s a or la s a ss l o or rs sa l s, or a l , ar o a a la l or s a ry s o r as o r or r. r a ra s , a ro la o r ro y r as s ar al a a ra o al os s o ro- o . , s ly r or ro s s l ar , a s r o ro o r s .

o al r la o ay a a a a o ra o o a o . o- lo al a a ay s y, say, ar a a la ll o - ro a a a's l s or a a ll r r y ars o s or a ro y ral o r .

o al r la o ay a o o , s s ally la s a r la ly r a r r o s all r s a o lar o s. os s o o ly so al r la o ar , , os s. a s s all r r s ro l ss o o r o s r os os s, r o l a os s r o o a a o sa a a r lar r r als. o al r la o s or l ly o or s all r r s o o s ss, s o r o r as o - ra o o s ry.

LESS GOVERNMENT IS NOT ALWAYS BETTER THAN MORE

o r a , r o o s o so al r la o o r r a l ss o r s o al ays r a or o r . l o ar sys s a o r l or ro oo s a s r s a ra o , as s a s. ro so al r la o o r a l arly r as

o o y a s so y's ll- . ro ally, y a ro
s o o a al s , so al r la o ay a s ro ro- a al s or . ro -
rly o a , so al r la o l s a a ol al s or or
ar sys . s or o l ly a r s a s a y s r a o
r or s o sa or la s, sa ro s, s r a ory r , o ol-
l o , ll-s r al a s, a l . o al r la o l s ar
sys l r o o ly oo s a s r s also a oo so y.

QUICK REVIEW

- Social regulation is concerned with the conditions under which goods and services are produced, the effects of production on society, and the physical characteristics of the goods themselves.
- Defenders of social regulation point to the benefits arising from policies that keep dangerous products from the marketplace, reduce workplace injuries and deaths, contribute to clean air and water, and reduce employment discrimination.
- Critics of social regulation say uneconomical policy goals, inadequate information, unintended side effects, and overzealous personnel create excessive regulation, for which regulatory costs exceed regulatory benefits.

The LAST word

THE MICROSOFT ANTITRUST CASE

In 2000 a U.S. District Court found Microsoft guilty of violating the Sherman Act, a U.S. anti-combines law. What were the specific findings? What remedy did the Court propose?

The Charges

In May 1998 the U.S. Justice Department, 19 individual states, and the District of Columbia (hereafter, "the government") filed antitrust charges against Microsoft under the Sherman Antitrust Act. The government charged that Microsoft had violated Section 2 of the Act by taking a series of unlawful actions designed to maintain its Windows brand monopoly. The government also charged that some of those specific actions violated Section 1 of the Sherman Act.

Microsoft denied the charges, arguing that it had achieved its success through product innovation and lawful business practices. Microsoft argued that it should not be penalized for its superior foresight, business acumen, and technological prowess. It also pointed out that its monopoly was highly transitory because of rapid technological advance.

The Findings

In June 2000 the District Court ruled that the relevant market was that of software used to operate Intel-compatible personal computers (PCs). Microsoft's 95 percent share of that market clearly gave it monopoly power. The Court pointed out, however, that being a monopoly is not illegal. The violation of the Sherman Act occurred because Microsoft used anticompetitive means to maintain and broaden its monopoly power.

According to the Court, Microsoft feared that the success of Netscape's Navigator, which allowed people to browse the Internet, might allow Netscape to expand its software to include a competitive PC operating system—software that would threaten the Windows monopoly. It also feared that Sun's Internet applications of its Java programming language might eventually threaten Microsoft's Windows monopoly.

To counter these and similar threats, Microsoft illegally tied Internet Explorer (Microsoft's

Internet browser) to Windows and provided Internet Explorer at no charge. It also signed contracts with PC makers that required them to feature Internet Explorer on the PC desktop and penalized companies that promoted software products that competed with Microsoft products. Moreover, it gave friendly companies coding that linked Windows to software applications and withheld it from companies featuring Netscape. Finally, under licence from Sun, Microsoft developed Windows-related Java software that made Sun's own software incompatible with Windows.

The Court concluded:

> Microsoft mounted a deliberate assault upon entrepreneurial efforts, that, left to rise or fall on their own merits could well have enabled the introduction of competition into the market for Intel-compatible PC operating systems.... More broadly, Microsoft's anticompetitive actions trammeled the competitive process through which the software industry generally stimulates innovation and conduces to the optimum benefit of consumers.*

The Remedy

The District Court ordered that Microsoft be split into two companies, one selling the Windows operating system and the other selling Microsoft applications (such as Word, Excel, Hotmail, MSN, PowerPoint, and Internet Explorer). Also, both companies are expressly prohibited from entering into joint ventures with one another, licensing or selling products to one another at more favourable terms than those given to other firms, or engaging in any activities that Microsoft used to thwart competition and maintain its monopoly. Both companies are free, however, to develop new products that compete with each other, and both can derive those products from the intellectual property embodied in the common products existing at the time of the divestiture. The rights to Internet Explorer, however, reside with the applications company.

The Appeal

Stunned by the verdict and the perceived harshness of the remedy, in late 2000 Microsoft appealed the District Court decision to a U.S. Court of Appeals. Microsoft claimed that the government had not proved its case and that District Court Judge Thomas Jackson evidenced bias against Microsoft throughout the case. A decision from the Appeals Court was still pending at the time of publication of this book. We urge you to research the status of the Microsoft case via an Internet search.

Sources: *United States v. Microsoft* (Conclusions of Law, April 2000; Final Order, June 2000) and Reuters New Service.

* *United States v. Microsoft* (Conclusions of Law), April 2000, p. 9.

CHAPTER SUMMARY

1. Mergers can be of three types: horizontal, vertical, and conglomerate.
2. The cornerstone of anti-combines policy consists of amendments to the Criminal Code in 1892 and the Combines Investigation Acts of 1910 and 1923. On the fifth attempt, the Competition Act was finally passed in mid-1986, supplanting the Combines Investigation Act.
3. The objective of industrial regulation is to protect the public from the market power of natural monopolies by regulating prices and quality of service.
4. Critics of industrial regulation contend that it can lead to inefficiency and rising costs and that in many instances it constitutes a legal cartel for the regulated firms. Legislation passed in the late 1970s and the 1980s has brought about varying degrees of deregulation in the airline, trucking, banking, railroad, and television broadcasting industries.

Studies indicate that deregulation is producing sizable annual gains to society through lower prices, lower costs, and increased output. The latest Canadian industries to begin the deregulation process are electricity and natural gas.

5. Social regulation in concerned with product safety, working conditions, and the effects of production on society. Whereas industrial regulation is on the wane, social regulation continues to expand. The optimal amount of social regulation is where MB = MC.
6. Those who support social regulation point to its numerous specific successes and assert that it has greatly enhanced society's well-being. Critics of social regulation contend that businesses are excessively regulated to the point where marginal costs exceed marginal benefits. They also say that social regulation often produces unintended and costly side effects.

TERMS AND CONCEPTS

anti-combines policy, p. 335
anti-combines (antimonopoly) legislation, p. 336
horizontal merger, p. 336
vertical merger, p. 336
conglomerate merger, p. 336
Combines Investigation Act, p. 337
Competition Act, p. 338
Competition Tribunal, p. 338
natural monopoly, p. 340
public interest theory of regulation, p. 340
legal cartel theory of regulation, p. 342
social regulation, p. 344

STUDY QUESTIONS

1. Both anti-combines policy and industrial policy deal with monopoly. What distinguishes their approach? How does government decide to use one form of remedy rather than the other?

2. **KEY QUESTION** Explain how strict enforcement of the anti-combines laws might conflict with (a) promoting exports to achieve a balance of trade, and (b) encouraging new technologies. Do you see any dangers in using selective anti-combines enforcement as part of a broader policy to increase exports?

3. **KEY QUESTION** How would you expect anti-combines authorities to react to (a) a proposed merger of Ford and General Motors; (b) evidence of secret meetings by contractors to rig bids for highway construction projects; (c) a proposed merger of a large shoe manufacturer and a chain of retail shoe stores; and (d) a proposed merger of a small life-insurance company and a regional candy manufacturer.

4. Suppose a proposed merger of firms would simultaneously lessen competition and reduce unit costs through economies of scale. Do you think such a merger should be allowed?

5. In the 1980s, PepsiCo Inc., which then had 28 percent of the soft-drink market, proposed to acquire the 7-Up Company. Shortly thereafter the Coca-Cola Company, with 39 percent of the market, indicated it wanted to acquire the Dr. Pepper Company. Seven-Up and Dr. Pepper each controlled about 7 percent of the market. In your judgment, was the government's decision to block these mergers appropriate?

6. "The anti-combines laws tend to penalize efficiently managed firms." Do you agree? Why or why not?

7. "The social desirability of any particular firm should be judged not on the basis of its market share but on the basis of its conduct and performance." Make a counterargument, referring to the monopoly model in your statement.

8. **KEY QUESTION** What types of industry, if any, should be subjected to industrial regulation? What specific problems does industrial regulation entail?

9. In view of the problems involved in regulating natural monopolies, compare socially optimal (marginal-cost) pricing and fair-return pricing by referring again to Figure 10-9. Assuming that a government subsidy might be used to cover any loss resulting

from marginal-cost pricing, which pricing policy would you favour? Why? What problems might such a subsidy entail?

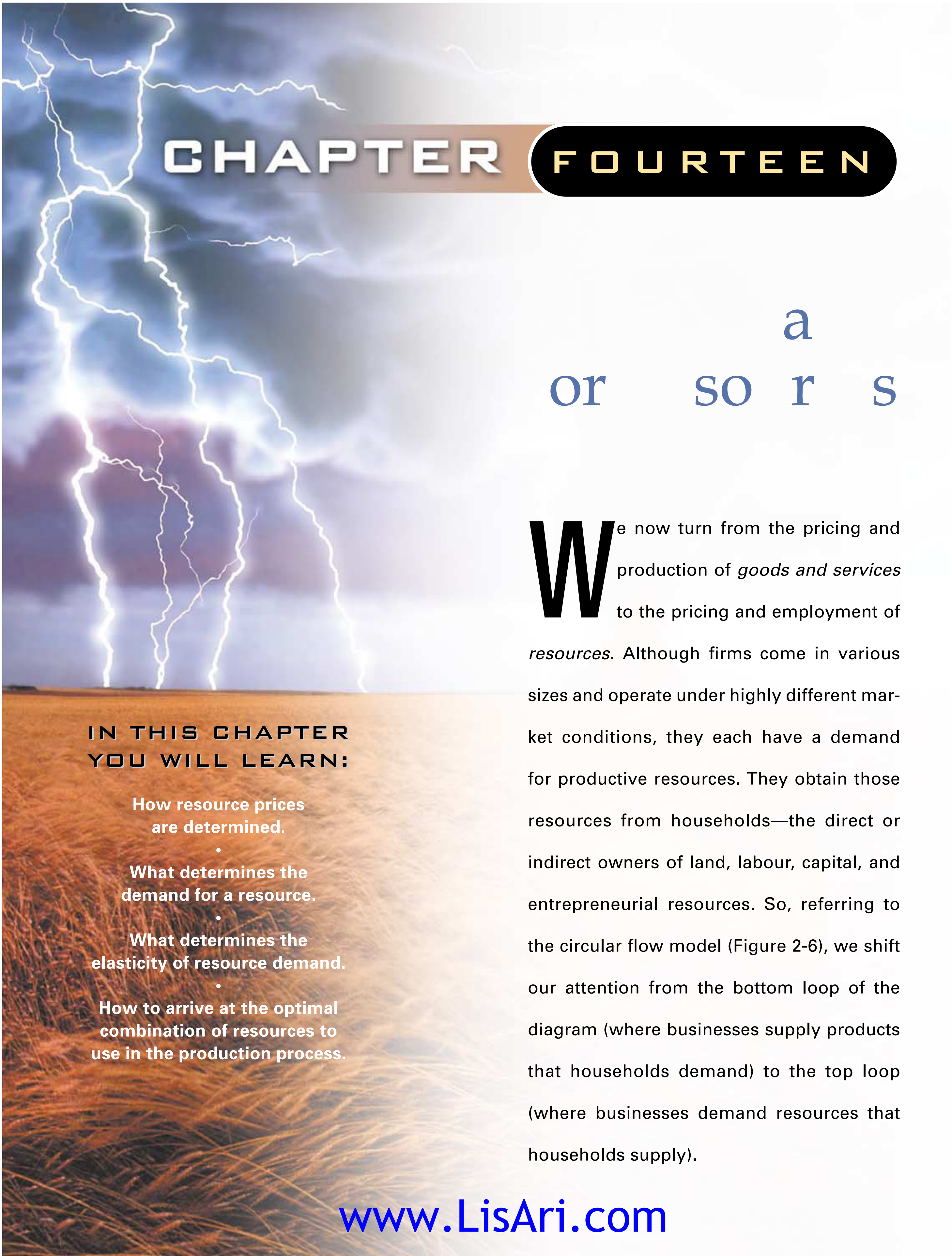
10. KEY QUESTION How does social regulation differ from industrial regulation? What types of benefits and costs are associated with social regulation?

11. Use economic analysis to explain why the optimal amount of product safety may be less than the amount that would totally eliminate risks of accidents and deaths. Use automobiles as an example.

12. **(The Last Word)** Under what law and on what basis did the U.S. federal government find Microsoft guilty of violating U.S. antitrust laws? What was the government's proposed remedy? In mid-2000 Microsoft appealed the District Court decision to a higher court. Update the Microsoft story, using an Internet search engine. What is the current status of that appeal? Is it still pending? Did Microsoft win its appeal? Or was the District Court's decision upheld?

INTERNET APPLICATION QUESTION

1. Visit Canada's Competition Tribunal's Web site at <www.ct-tc.gc.ca/english/current.html>. Review the current filings. What companies does the latest filing include? Scroll down to "Decision Rendered." Review the case of the Bank of Montreal. On what basis did the Commissioner of Competition make its decision?



CHAPTER FOURTEEN

a
or so r s

IN THIS CHAPTER YOU WILL LEARN:

How resource prices are determined.

•

What determines the demand for a resource.

•

What determines the elasticity of resource demand.

•

How to arrive at the optimal combination of resources to use in the production process.

We now turn from the pricing and production of *goods and services* to the pricing and employment of *resources*. Although firms come in various sizes and operate under highly different market conditions, they each have a demand for productive resources. They obtain those resources from households—the direct or indirect owners of land, labour, capital, and entrepreneurial resources. So, referring to the circular flow model (Figure 2-6), we shift our attention from the bottom loop of the diagram (where businesses supply products that households demand) to the top loop (where businesses demand resources that households supply).

s a r loo s a *demand* or o o r so r s. l o s sso s o r s o la o r, r l s lo also a ly o la , a al, a r r r al a l y. a r 1 ll o r so r (la o r) a la o r *l* o a aly a ra s. a r 1 ll s r so r a a r so r s ly o a r so , a r r s o, o r ro r so r s.

SIGNIFICANCE OF RESOURCE PRICING

r ar s ral oo r aso s o s y r so r r

- ***Money-income determination*** so r r s ar a a or a or r-o o o s ol s. r s a r s a a r-o o r so r s o as a , r , r s , a ro o s o o s ol s a s ly os r so r s.
- ***Resource allocation*** s as ro r s allo a s oo s a s r-s o o s rs, r so r r s allo a r so r s a o s r s a r s. a y a o o y, r olo y a as s o a , allo a o o r so r s o r alls or o s o r so r s ro o s o a o r. so r r s a a or a or ro-os s s.
- ***Cost minimization*** o r , r so r r s ar os s, a o r al a -ro , r s ro ro - a o os (l as os ly) o a o o r so r s. so r r s lay a rol r a s o la , la o r, a al a r r -r al a l y a ll o ro a oo ors r .
- ***Ethical questions and policy issues*** a y al s o s a l ol y ss s s rro r so r ar . a r o o al y s a -a l o l o r l y as al a o ss ay o or ora -s o l ral o r s a l s a l al a o s a s s or o r o ro s s s o ar rs a s, s, a a s r la o o s r o ar all as o r so r r .

<www.rci.rutgers.edu/~gag/NOTES/micnotes11.html> Marginal productivity theory of distribution

MARGINAL PRODUCTIVITY THEORY OF RESOURCE DEMAND

Choosing a Little More or Less

o a s s l , ll rs ass a a r r s a ra r so r a r ly o r so r ar a s lls s o a r ly o ro ar . s l y o s s a o s o ol a o ro -ar r s a r - a r a a s os o as l l or as o as oos s a ar r . r s s ll s a l l ra o o o al o a r s o o ro r . larly, o r so r ar , r s a a - a r. r s s a l l ra o o o al s ly o r so r a a o r so r r .

DERIVED DEMAND The demand for a resource that depends on the products it can be used to produce.

Resource Demand as a Derived Demand

a or r so r s s a **derived demand** s r ro ro s a os r so r s l ro . so r s s ally o o r ly sa s y s o r a s o so r ly ro r s ro oo s a s r s. o o a s o o s a ar o la , a o r ra or, or la o r s r s o a ar r, o s ol s o a o o s oo a r ro s a s r so r s l ro . larly, a or a r la s ra s a a or ass l rs, a a s or s s r s as o - a r ara o , a r s, a l ar r a r a s or a o a s, ar rs, a l - ar or - rs. Glo al rs 1 .1 o s ra s a lo al a or la o r s r .

Marginal Revenue Product (MRP)

r a r o r so r a a s a s r o a or a y r so r ll o

- ro y o r so r l o r a a oo
- ar al or r o oo l s o ro

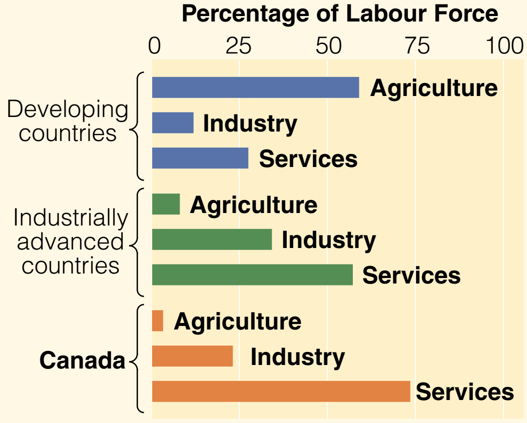
r so r a s ly ro r o a ly al o o y ll r a a , l ar la ly ro r so r a s a a l o ro- o ly a sl ly al o o y ll l l a . r ll o a a all or a r so r a s o ally ro so a o o a s o y.

PRODUCTIVITY

a l 1 -1 s o s rol s o ro y a ro r r r so r o a . r , ass a a r a s o ar a l r so r , la o r, o s la . ol s 1 a 2 r o s o r so r

GLOBAL PERSPECTIVE 14.1

Labour demand and allocation: developing countries, industrially advanced countries, and Canada



The idea of derived demand implies that the composition of a country's product-market demand will determine the allocation of its labour force among agricultural products, industrial goods, and services. Because lower-income nations must spend most of their incomes on food and fibre, the bulk of their labour is allocated to agriculture. The industrially advanced economies with higher incomes allocate most of their labour to industrial products and services.

Source: International Labour Organization data, <www.ilo.org>.

TABLE 14-1 THE DEMAND FOR LABOUR: PURE COMPETITION IN THE SALE OF THE PRODUCT

(1) Units of resource	(2) Total product (output)	(3) Marginal product, MP	(4) Product price	(5) Total revenue, or (2) × (4)	(6) Marginal revenue product, MRP
0	0		$2	$ 0	
1	7	7	2	14	$14
2	13	6	2	26	12
3	18	5	2	36	10
4	22	4	2	44	8
5	25	3	2	50	6
6	27	2	2	54	4
7	28	1	2	56	2

MARGINAL PRODUCT (MP) The extra output produced with one additional unit of a resource.

a l o ro o a r s l o al ro (o). ol ro s **marginal product (MP)**, or a o al o , r s l ro a a o al r so r . ol s 1 ro r s a la o s r r s a l s r , a s ar al ro o la o r o all yo so o . or s l y, ass a os s ar al r r s os l s ar al ro a r rs or r r .

PRODUCT PRICE

MARGINAL REVENUE PRODUCT (MRP) The change in total revenue from employing one additional unit of a resource.

r a or a r so r s also o r o o o y ro s. ol a l 1 -1 a s s r or a o . ro r s o - s a , s as a $2, a s ar ass a o ro ar . r s a r - a r a ll s ll s o o o ly a s ar r . l ly ol 2 y ol s s o al-r a a o ol . s ar a o s o r r r al s ro ar o s l ls o r so r sa . ro s o al-r a a a o **marginal revenue product (MRP)**, a o al r r s l ro s o a a - o al o a r so r (la o r, s as). a o or ,

$$\text{ar al r ro} = \frac{\text{a o al r}}{\text{o a r so r a y}}$$

s ar l s ol a l 1 -1.

Rule for Employing Resources: MRP = MRC

The MRP ched le, ho n a col mn 1 and 6, i he m' demand ched le fo labo . o la y, s rs s ss r l a s a ro -s r r- a y r so r *To ma imi e o , a m ho ld hi e addi ional ni of a eci c e o ce a long a each cce i e ni add mo e o he m' o al e en e han i add o o al co* .

o o ss s s al r s o s a a a a o al o la o r or o r ar a l r so r a s o o al os a a a s o o al r . a s a as r s o a s ss o a r so r a s o o al r . a o a a a o al o a r so r a s o r 's o al (r so r) os s all s **marginal resource cost (MRC)**. a o or ,

$$\text{ar al r so r os} = \frac{\text{a o al (r so r) os}}{\text{o a r so r a y}}$$

o a r s a o r r l or r r so r s as ollo s ll ro a l or a r o r a o al s o a r so r o o a a r so r 's s al o s . r o or rs a r s rr ly r s s a o las or r s s or r , r a ro y r- or or rs. r r s s a o las or r s s or r , r s r or rs o ar o ay r ay, a a r as s ro y s ar so or rs. o ay a r - o a s **MRP = MRC rule** s s lar o ro - a r l loy ro o o r s ss o o r a o r a o . ra o al o o r l s s sa , o o r r s o *in* o a r so r , o *o* o a ro .

MARGINAL RESOURCE COST (MRC) The amount that each additional unit of resource adds to the firm's total (resource) cost.

MRP = MRC RULE To maximize economic profit (or minimize losses) a firm should use the quantity of a resource at which its marginal revenue product is equal to its marginal resource cost.

MRP as Resource Demand Schedule

a r ly o la o r ar , s ly a a s a l s a ra . a s a r r s s a s all ra o o ar s ly, a o ar a ra s a a - a r, o a a - a r. s a s a or a a o al o la o r r , o al r so r os r as s y a ly a o o o s a ar a ra . o la o r a ly als ar a ra . s, r so r r (ar a ra) a r so r os (ar- al r so r os) ar al or a r a r s a r so r a o la o r ar . r l lls s a , r o o , r ll r or rs o o a ar *age a e* (s) s al o s . r s o a a ol s 1 a a l 1 -1, ar a ra s, say, $1 . , r ll r o ly o or r, a s rs or r a s $1 o o al r a sl ly l ss $1 . o o al os . o r or s, a s s or s or r, s ro a l o r a or r. or a s - ss or r, o r, ($1 .) s ($12 or l ss), a a ll o ro a l o r a y o os or rs. a ra s $11. , y sa r aso s o r a ll ay r o r o rs a s o or rs. larly, a ra s $. , r ll r . $. , o r. $. , . so or . , *he MRP ched le con i e he m' demand fo labo , beca e each oin on hi ched le (o c e) indica e he n mbe of o ke he m o ld hi e a each o ible age a e.* r 1 -1, s o *D* r as o a a a l 1 -1.

lo r ll a l ar o yo a r a l r - als- ar al- os (*P*) r l or ro - a o o s o r a or- o o r ly o r 's s or -r ar al- os r ly a o r s s or -r ro s ly r . r , ar a ly (r so r r) r l or ro - a o s o r a r ly o r 's r s s *e o ce demand* r .

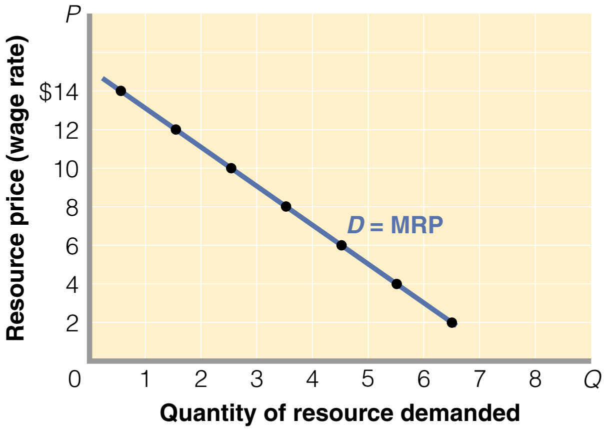
Resource Demand under Imperfect Product Market Competition

r a alys s o la o r a o s or o l r s s ll s ro a r ly o ar , o r s a r -

<cepa.newschool.edu/het/essays/margrev/distrib.htm#marginal> Marginal productivity theory of distribution

FIGURE 14-1 THE PURELY COMPETITIVE SELLER'S DEMAND FOR A RESOURCE

The MRP curve is the resource demand curve; each of its points relates a particular resource price (= MRP when profit is maximized) with a corresponding quantity of the resource demanded. Under pure competition, product price is constant; therefore, the downward slope of the *D* = MRP curve is due solely to the decline in the resource's marginal product (law of diminishing marginal returns).



a r. r o o oly, ol o oly, a o o ol s o o ro
ar all a a r ’s ro a r s o slo r
s s a lo r r o r as s sal s.

ro y a a a l 1 -1 ar r a ol s 1 o a l 1 -2.
r s o ol a ro r s lo r o s ll ar-
al ro o a s ss or r. o r ly o s ll r
o a l 1 -1 alls or o r aso ar al ro s s. o
r ly o s ll r o a l 1 -2 alls or o r aso s ar al ro
s s *and* ro r alls as o r as s.

as a lo r r a o a y a r as o (o al
ro) a l s o o ly o ar al ro o a s ss or r also

TABLE 14-2 THE DEMAND FOR LABOUR: IMPERFECT COMPETITION IN THE SALE OF THE PRODUCT

(1) Units of resource	(2) Total product (output)	(3) Marginal product, MP	(4) Product price	(5) Total revenue, or (2) × (4)	(6) Marginal revenue product, MRP
0	0		$2.80	$ 0	
		7			$18.20
1	7		2.60	18.20	
		6			13.00
2	13		2.40	31.20	
		5			8.40
3	18		2.20	39.60	
		4			4.40
4	22		2.00	44.00	
		3			2.25
5	25		1.85	46.25	
		2			1.00
6	27		1.75	47.25	
		1			−1.05
7	28		1.65	46.20	

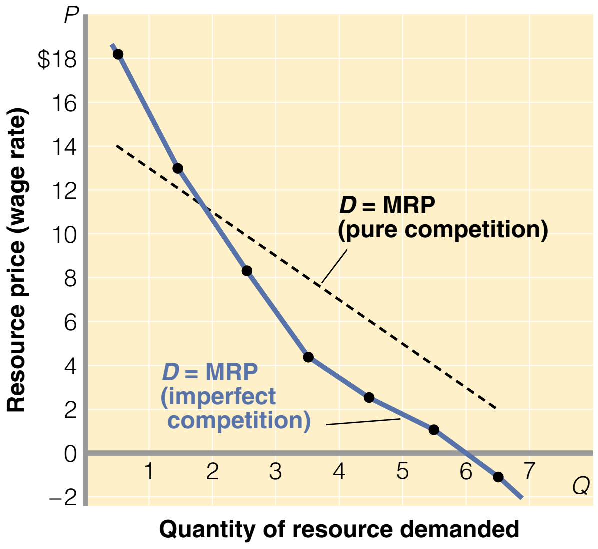
o all io o ni ha o he i e co ld ha e been old a a highe ice. o a s o or r's ar al ro s s s. s s s a sol or $2. 0 a , or, as a ro , or $1 . 0. s s o o s o or r. o s ll s s s, r s a a 20- r o s s ro y rs or r s a o r s o l a sol or $2. 0 a . s, o s o or r s o ly $1 .00 $1 . 0 (× 20 s) , as s o .

larly, r or r a s s o o al ro , a s s ar or $2.20 a , or $11.00 o al. o s ll s s r s a a 20- r o 1 s ro y rs o or rs. o r or r's s o ly $. 0 $11.00 (1 × 20 s) . o r r s ol ar r sa ay.

r s l s a r r so r a r o r ly o ro r s l ss las a a o r ly o ro r. a a ra or o $11. , o r ly o a r ly o - s ll r ll r o or rs. a $. o r ll r r , a r ly o r o ly o. $. r ly o r ll loy o r loy s, a r o or o ly r . o a s s r r so r a las y ra a a a l 1 -2 a o ar ra r 1 -1, as o r 1 -2.[1]

FIGURE 14-2 THE IMPERFECTLY COMPETITIVE SELLER'S DEMAND CURVE FOR A RESOURCE

An imperfectly competitive seller's resource demand curve *D* (solid) slopes downward because both marginal product and product price fall as resource employment and output rise. This downward slope is greater than that for a purely competitive seller (dashed resource demand curve) because the pure competitor can sell the added output at a constant price.



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[1] Note that we plot the points in Figures 14-1 and 14-2 halfway between succeeding numbers of resource units, because MRP is associated with the addition of one more unit. Thus, in Figure 14-2, for example, we plot the MRP of the second unit ($13.00) not at one or two, but rather at 1.5. This smoothing enables us to sketch a continuously downsloping curve rather than one that moves downward in discrete steps as each new unit of labour is hired.

s o s r r s a r ly o ro r s l ss r s o s o r so r r s a r ly o ro r. r o - or's r la r l a o loy or r so r s, a ro or o , r so r r s all r s r o or's y or s r o - ro ar . r s al, r ly o s ll r ro s l ss o a ro a a r ly o s ll r. ro a s all r o , a s r r so r s. r s o or a al a o . o a r 11 a ar s r r o ol o oly *migh* l a o olo al ro r ss a r a r ro o , or loy , a lo r r s ry lo r a o l a r ly o - ar . r so r a r s as s o l l ar r o r a o l o r r s r as a r s l o o o oly o r. (*Key Question* 2)

Market Demand for a Resource

a o la al r 's a r or a r so r . all a o al, or ar , a r or a *od c* s o y s or o - ally a r s o all al y rs ar . ar a r or a ar lar *e o ce* s r ss ally sa ay y s al a or r s or all r s r a r so r .

QUICK REVIEW

- To maximize profit a firm will use a resource in an amount at which the resource's marginal revenue product equals its marginal resource cost (MRP = MRC).
- Application of the MRP = MRC rule to a firm's MRP curve demonstrates that the MRP curve is the firm's resource demand curve. In a purely competitive resource market, resource price (the wage rate) equals MRC.
- The resource demand curve of a purely competitive seller is downsloping solely because the marginal product of the resource diminishes; the resource demand curve of an imperfectly competitive seller is downsloping because marginal product diminishes and product price falls as output is increased.

DETERMINANTS OF RESOURCE DEMAND

a ll al r a or a r so r a s, s r so r a r a a r so r a s r ro *od c demand* a s o *e o ce od c i i* s s s o s a s r so r a s. lso, o r a alys s o o a s r so o r ro s a s a ro 's a r (a r) s s s a o r a or a s r s o o r *e o ce* .

<www.theshortrun.com/classroom/glossary/micro/resource.html>
Resource demand

Changes in Product Demand

r s al, *an inc ea e in he demand fo a od c ha e a a ic la e o ce ill inc ea e he demand fo he e o ce he ea a dec ea e in od c demand ill dec ea e he e o ce demand.*

’s s o s or s. rs o r all s a a a a or a ro ll a s r . a l 1 -1, l ’s ass a a r as ro a oos s ro r ro $2 o $. o s o l al la r so r a s l (ol s 1 a) a o l r s l , a lo r 1 -1 o r y a r so r a r l s o r o ol a r . larly, a l ro a (a r) ll s r so r a r o l . s r so r a a alo ro a o s ra s a r so r a s r ro ro - a .

Changes in Productivity

r s al, *an inc ea e in he od c i i of a e o ce ill inc ea e he demand fo he e o ce and a dec ea e in od c i i ill ed ce he e o ce demand.* o l a a o ol a l 1 -1, a a o ol o l also o l , a a r as (r ar s) r so r a r . ro y o a y r so r ay al r s ral ays

- ***Quantities of other resources*** ar al ro y o a y r so r ll ary a s o o r r so r s s . r a r a o o a al la r so r s s , say, la o r, r a r ll la o r’s ar al ro y a , s, la o r a .
- ***Technological progress*** olo al ro s a r as al- y o o r r so r s, s as a al, a sa . r *al- i* o a al, r a r ro y o la o r s . o or rs loy a s a o o r al a al or o loa ra s ar or ro a o or rs sa a o o r al a al o ol r o y r- l sys s.
- ***Quality of the variable resource*** ro s al y o ar a l r so r , s as la o r, ll r as s ar al ro y a r or s a . , r ll a a r or a r , or s ll , o la o r.

ll s o s ra o s l la y a ra l l o (r al) a s s r s r ally a a a o s (or a l , a a a, G r a y, a a , a ra) a lo a o s (or a l , a, o a, ola, a a - o a). or rs s r ally a a a o s ar rally al r, r - a , a r ra a ar or rs lo o r s. lso, os s r s, or rs s r ally a a a o s or a lar r a or s o o a al oo s a or a a a ral r so r s. s r a s a s ro a or la o r. s ly s o ar , la o r s *ela i el* s ar o ar a os lo a o s. s ro a a a r l- a ly s ar s ly o la o r r s l a ra s s r ally a a a o s.

Changes in the Prices of Other Resources

s as a s r s o o r ro s ll a a or a s ro , a s r s o o r r so r s ll a a or a s - r so r . lso r all a o a a r or ro o a or ro s o r a ar s s oo s or o l ary oo s *in con m ion.* larly, o a a r o r so r o a or r so r s o rs s a l y or r o l ar y *in od c ion.*

SUBSTITUTE RESOURCES

os olo y a r a ro o ro ss s s a la o r a a- al ar s s a l . r a ro so s a o o o s a r l- a ly s all a o o la o r a a r la ly lar a o o a al, or rsa. o ass a r o a ry (a al) alls. o a or la o r ll r s l o o o os s s s o a o .

- ***Substitution effect*** l r o a ry ro s r o s s a ry or la o r. s s s o allo s r o ro s o a a lo r os . o, a a ra , s all r a s o la o r ar o loy . s **substitution effect** r as s a or la o r. or rally, s s o a s a a r ll r- as or o a os r la r as l a , o rs ly, s l ss o a o os r la r as r as .
- ***Output effect*** a s r o a ry as all , os s o ro - ar o s o s s also l . lo r os s, r s ro - a l o ro a s ll a r a r o . r a r o r as s a or all r so r s, l la o r. o, s **output effect** r as s a or la o r. or rally, o a s a r ll r as or o o ar lar r o o r alls a l ss o a ar lar r o o r r s s.
- ***Net effect*** s s o a o s ar o r s r o a a s, y or o os r o s. or a l r o a al, s s o r as s a or la o r a o r as s . a la o r a s o r l- a s s o o s.

r s o r so r a , s s o o s o , a r as r o a al r as s a or la o r. o s s s o , a r as r o a al r as s a or la o r.

SUBSTITUTION EFFECT A firm will purchase more of an output whose relative price has declined and use less of an input whose relative price has increased.

OUTPUT EFFECT An increase in the price of one input will increase a firm's production costs and reduce its level of output, thus reducing the demand for other outputs (and vice versa).

COMPLEMENTARY RESOURCES

all ro a r a r a ro s, s as a ras a l or o rs a so ar , ar o l ary oo s y o o r a ar o ly a . so r s ay also o l ary a r as a y o o o s ro o ro ss r r s a r as a o s r- o o r as ll, a rsa. os a s all s r o s o r- ass s s ( ) r la ly s rso al o rs as s as o a al . a o r r r s a s l s r o o r- a a s o a o a ll o r s l a a s o r o l a o o o. o ass a a olo al a a ro o o s o - rs s s a ally r s r r . o s s o a o r, a s la o r a a al s s *ed o o ion* , o rso or o a . a al a o s s or la o r. r *i* a o . r s al, r o r o a al oo s a s lo r ro o os s. ll, r or , ro a l o ro a lar r o . o so, r ll s o or a al a or la o r. *When labo and ca i al a e com lemen a , a decline in he ice of ca i al inc ea e he demand fo labo h o gh he o effec .*

a as o r a alys s o s s r so r s a o l ary r so r s a ly r s o a l r o a al. a l 1 - s ar s o a *inc ea e* r o a al o a or la o r s y ar lly.

o a a s ss ll l s o r a s o la o r a , l ’s a a r r s. a r s o la o r r so r , a or la o r ll r as (la o r a r ll s r ar)

- a or (a r or r o) ro ro y a la o r *inc ea e* .
- ro y ( ) o la o r *inc ea e* .
- r o as s *dec ea e* , ro o s s s o .
- r o a s s *inc ea e* , ro s s o s o .
- r o a o l ary *dec ea e* .

s r a yo a r rs s s o la a *dec ea e* la o r a . a l 1 - ro ss ral ll s ra o s o r a s o la o r a , l s y a or s o r a s a s ss a los loo .

TABLE 14-3 THE EFFECT OF AN INCREASE IN THE PRICE OF CAPITAL ON THE DEMAND FOR LABOUR, D_L

(1) Relationship of inputs	**(2) *Increase* in the price of capital**		
	(a) Substitution effect	**(b) Output effect**	**(c) Combined effect**
Substitutes in production	Labour substituted for capital	Production costs up, output down, and less of both capital and labour used	D_L increases if the substitution effect exceeds the output effect; D_L decreases if the output effect exceeds the substitution effect
Complements in production	No substitution of labour for capital	Production costs up, output down, and less of both capital and labour used	D_L decreases

TABLE 14-4 DETERMINANTS OF LABOUR DEMAND: FACTORS THAT SHIFT THE LABOUR DEMAND CURVE

Determinant	Examples
Changes in product demand	Gambling increases in popularity, increasing the demand for workers at casinos. Consumers decrease their demand for leather coats, decreasing the demand for tanners. The federal government reduces spending on the military, reducing the demand for military personnel.
Changes in productivity	An increase in the skill levels and output of glassblowers increases the demand for their services. Computer-assisted graphic design increases the productivity of, and demand for, graphic artists.
Changes in the price of another resource	An increase in the price of electricity increases the cost of producing aluminum and reduces the demand for aluminum workers. The price of security equipment used by businesses to protect against illegal entry falls, decreasing the demand for night guards. The price of telephone switching equipment decreases, greatly reducing the cost of telephone service, which in turn increases the demand for telemarketers.

Occupational Employment Trends

a s la o r a a o s ra l s a , s y a a ra s a loy s o a o s. r as s la o r a or r a o a o al ro s r s l r as s r loy , a r as s la o r a r s l r as s r loy . or ll s ra o , l 's loo a o - a o s a ar ro a . (a ra s ar s o a r).

THE FASTEST GROWING OCCUPATIONS

<www.adin.org/lmi/fastest.htm> Fastest growing and declining occupations, Ontario, 1995–2005

o a o s a ar ro ly a a a o o y o s r o a o s. ral, a or s r or rs s ra ly o a a or a a r , o s r o , a or rs. o as s ro o s ar r ly o r-r la . r as a or o r rs, o r s or s al s s, sys s a alys s, a a as a a rs, a s o l s s al s s r la s o ra r s a or o rs, o r s r s, a r . also r la s o r s ro y o s ar- lar or rs, as ly ro al y o o r a o a- o s y or . r l so s a a as ro r o a s s o , r as a or s y s o la o r. r o o r as s ro o a o s r la o al ar rso al ar a o al ar a s, al ass s a s, a ys a ass s a s. ro - a s or s y s o la o r ar r ro ro a or al s r s, a s ys ral a ors. a o a a a o la o as ro or al ro l s, a r s s a ar o o as l o r a r r s o al ar .

ELASTICITY OF RESOURCE DEMAND

loy a s a s s ss r s l ro s s lo a o s o r so r a r s. a s a s s s ro

a s a y o a r so r a a s y a a r
o s r so r r o s ra o . a a s o a s y a s
o a r ra r y a o ro o o o a o ro a
r so r a r . or a l , r 1 -1 o a a r as
a ra ro $ o $ ll r a y o la o r a ro o
o r s. s s a a *an i of labo demanded* as s ro a *change in demand*.

s s y o ro rs o a s r so r r s s as r y **elasticity of resource demand.** o or ,

ELASTICITY OF RESOURCE DEMAND The percentage change in resource quantity divided by the percentage change in resource price.

$$E_d = \frac{\text{r a a r so r a y}}{\text{r a a r so r r}}$$

E_d s r a r a o , r so r a s las E_d s l ss a o ,
r so r a s las a E_d als o , r so r a s -
las . (all ro a r a a las y as a a s , s
a sol al .) a r s las y o r so r a ral a -
ors ar a or .

RATE OF MP DECLINE

r ly al o s ra o s ra a ar al ro o
ar lar r so r l s. ar al ro o o r so r l s slo ly
as s a o a a o o o r r so r s, a ( ) r or a
r so r l s slo ly a s o ly las . s all l r
o s a r so r ll y l a r la ly lar r as a o a .
o rs ly, ar al ro o r so r l s s ar ly as or o s
a , r so r a r also l s ra ly. s a s a a r la ly
lar l a ra ll a o a y a o s r as
a o o la o r r la o r a s las .

EASE OF RESOURCE SUBSTITUTABILITY

r o r so r s ar s s a l s also a r a o las y. *The la ge he n mbe of a i fac o b i e e o ce a ailable, he g ea e he ela ici of demand fo a a ic la e o ce.* a r r a a r r s a or s -
r y s o oo ar ally sa s a ory a o a l s, a r s
r o a y o y o oo ay a s a s ar ro a o a as
ro r s s s o o o r oo s. o r r , o r aso a l
s s s ay s a s a sol ly ss al ro o o al
o s. s, a or a y al ro rs s las .

Time a lay a rol s s o ro ss. or a l , a r 's r
r rs ay o a a s s a al a r as l l or o a l
loy . o r , as r 's r s ar o a ar r la , a
a r as ay o a o a y o r as lar r r s a a
ay l r sa o al o r r rs. o r a l s
o r al a r ra a r r o ly o o rso l ra r a or r
r , a a a so s s a l y la o r a a al r s
o .

ELASTICITY OF PRODUCT DEMAND

las y o a or a y r so r s o las y o a or
ro l s ro . *The g ea e he ela ici of od c demand, he g ea e*

he ela ici of e o ce demand. r a r o r so r a l a s s o s r la o s . s all r s r o a ro r a las- y o a ll s ar ly r o , r a o r la ly lar - l s a o so ar o s r so r s a a or r so r s las .

r a r so r a r o r 1 -1 s or las a r so r a r s o r 1 -2. r ar s s a s - r 1 -1, ass a r ly las ro a r , l r 1 -2 s as o a o slo or l ss a r ly las ro a r .

RATIO OF RESOURCE COST TO TOTAL COST

The la ge he o o ion of o al od c ion co acco n ed fo b a e o ce, he g ea e he ela ici of demand fo ha e o ce. r , la o r os s o ly ro- o os , a 20 r r as a ra s ll s all r 's os r s ar y 20 r . ro a s las , ss s a al r as os s ll a s a r la ly lar l sal s a a s ar l a o o la o r a . o la o r a s ly las . la o r os s o ly 0 r o ro o os , a 20 r r as a ra s ll r as os s y o ly 10 r . sa las y o ro a , s ll a s a r la ly s all l sal s a , r or , a o o la o r a . s as a or la o r s l ss las . (***Key Question* 3**)

QUICK REVIEW

- A resource demand curve will shift because of changes in product demand, changes in the productivity of the resource, and changes in the prices of other inputs.
- If resources A and B are substitutable, a decline in the price of A will decrease the demand for B provided the substitution effect exceeds the output effect. If the output effect exceeds the substitution effect, the demand for B will increase.
- If resources C and D are complements, a decline in the price of C will increase the demand for D.
- Elasticity of resource demand measures the extent to which producers change the quantity of a resource they hire when its price changes.
- The elasticity of resource demand will be less the more rapid the decline in marginal product, the smaller the number of substitutes, the smaller the elasticity of product demand, and the smaller the proportion of total cost accounted for by the resource.

OPTIMAL COMBINATION OF RESOURCES

Choosing a Little More or Less

o ar o r a o s as o o ar a l , la o r. lo r , r s a ary a o so all r so r s y s . a 's y o o- s r a o a o o r so r s a r ll oos *all* s s ar ar- a l . l o r a alys s s as o o r so r s, a o a y ro s.

ll o s r o rr la s o s

1. a o a o o r so r s ll os s a a s l lo o

2. a o a o o r so r s ll a ro

The Least-Cost Rule

LEAST-COST COMBINATION OF RESOURCES The quantity of each resource a firm must employ to produce a particular output at the lowest total cost.

r s ro a s o **least-cost combination of resources** *hen he la dolla en on each e o ce ield he ame ma ginal od c .* a s, os o a y o s ra os o ar al ro o r o las s o r so r s s ar sa or a r so r . o r so r ar s ar al r so r os s ar r so r r r a r as a y or as s o r so r s as a s a a r . , s o r so r s, la o r a a al, a o r s s o al os o a s o

$$\frac{\text{ar al ro o a o r(}_{L}\text{)}}{\text{r o a o r}(P_L)} \quad \frac{\text{ar al ro o a al(}_{c}\text{)}}{\text{r o a al(}_{c}\text{)}} \qquad (1)$$

ro o , ll r r o ar al ro s o la o r a a al as $_L$ a $_C$, r s ly, a sy ol r o la o r y P_L a r o a al y P_C.

o r a l s o s y l ll o o a o (1) l a s o l as - os ro o . ss a r o o a al a la o r s $1 r , a y ar rr ly loy s a o s a ar al ro o la o r s 10 a ar al ro o a al s . r a o a ly lls s a s s o l as os ly o a o o r so r s

$$\frac{P_L \times 10}{P_L \times \$1} \quad \frac{_C \times}{P_C \times \$1}$$

os r s s $1 l ss o a al a s s a ollar o la o r. los s s o o ro y las ollar's or o a al, a s 10 s o o ro ra ollar's or o la o r. o r as s y (10) s or sa o al os . or s s o ollars ro a al o la o r ll s r *do n* alo s r or la o r a alo s r or a al, r as o a o r o ar a os o o - l r r a o (1) s l ll . a l r os o , r ol-lar or las o o la o r a a al , or a l , s . r ll ro a r a r o or sa (or al) os .

r sa o al r so r os a r s l a r a r o al o , os r a r or o al os o a y s l l o o a r . a l o ro a *la ge* o a *eci c* o al os s sa as a l o ro a *eci c* o a *malle* o al os . r o r a l ys $1 l ss o a al, s o ll all y s. s s o ly $. 0 o a ollar o la o r, r ll r as s o y a o sa s ($^1{}_2$ o r ollar). r ll r al sa o al o a a $. 0 lo r o al os .

os o ro a y s o a r as lo as a o (1) o s o ol . ollars a s a al a la o r o o r a o (1) ol s, o a o al a s s o a al a la o r ll r os s r r. r s o ro a o s l as - os o a o o a al a la o r.

All he long- n co c e de elo ed in Cha e 8 and ed he eaf e a me ha he lea -co combina ion of in ha been eali ed a each le el of o . y r a o - s r so r s ola o o l as - os r l o l a a r- a - ssary a ra o al os a a l l o o a s, o l r *X-inef cienc* , as s-ss r 10- .

ro r's l as - os r l s a alo o s o o s r's l y- a r l s r a r . a l y- a o a o o oo s, o s rs o s r o r r r s, as r s - ar al- l y a a, a r s o ar o s ro s. larly, a os - o a o o r so r s, ro rs o s r o ar- al ro a a a r (os s) o ar o s r so r s.

The Profit-Maximizing Rule

os s o s or a ro . r a ro a y l l o o l as os ly ay y a ly a o (1), o ly o l l o o a a ro . r arl r a alys s o ro ar s s o a s ro - a o o rs r ar al r als ar al os ( ). ar o s a r, r a o l r s ro - a o o as as r la s o r so r s.

a r ly o r so r ar , ar al r so r os ( ) s a ly al o r so r r , *P*. s, or a y o r so r ar , a as o r ro - a a o

(r so r) *P* (r so r)

s o o s ol or ry ar a l r so r a lo r all r so r s ar ar a l . o ar s, a r ll, r or , a s **profit-maximizing combination of resources** a r so r s loy o o a s ar al r ro als s r . or o r so r s, la o r a a al, o P_L $_L$ a P_C $_C$ a o s o o s y o s s o a a o y r r s r s a a r s l s, o

PROFIT-MAXIMIZING COMBINATION OF RESOURCES The quantity of each resource a firm must employ to maximize its profits or minimize its losses.

$$\frac{{}_{L}}{P_L} \qquad \frac{{}_{C}}{P_C} \qquad 1 \tag{2}$$

o a o (2) a s o s a s o o r so r s *o o iona e o* r r s s s *e al* o r r s a ra os, r or , al o o . or a l , $_L$ \$1 , P_L \$, $_C$ \$, a P_C \$, r s r loy o a al a la o r o ra os o o r so r r ar al or o r so r s. r a a s ro y r a o al a o s o o a al a la o r l o s o r o slo r s o o s a $_L$ \$ a $_C$ \$. ra os ll / a / a al o o .

ro - a os o a o (2) l s os - o - o o a o (1). a s, a r s ro a or o a o (2), s s l as - os o a o o s o o so. o r, o rs s o r a r o ra a l as os a or o a o (1) ay o o ra a o a a s s ro .

Numerical Illustration

r al ll s ra o ll l yo rs a l as - os a ro - a r l s. ol s 2, , 2', a ' a l 1 - , s o o al ro - s a ar al ro s or ar o s a o s o la o r a a al a ar ass o o ly s ro so ro , say, y a s. o s ar s o s r r s.

TABLE 14-5 DATA FOR FINDING THE LEAST-COST AND PROFIT-MAXIMIZING COMBINATION OF LABOUR AND CAPITAL*

LABOUR (PRICE = $8)					CAPITAL (PRICE = $12)				
(1) Quantity	(2) Total product (output)	(3) Marginal product	(4) Total revenue	(5) Marginal revenue product	(1′) Quantity	(2′) Total product (output)	(3′) Marginal product	(4′) Total revenue	(5′) Marginal revenue product
0	0		$ 0		0	0		$ 0	
1	12	12	24	$24	1	13	13	26	$26
2	22	10	44	20	2	22	9	44	18
3	28	6	56	12	**3**	28	6	56	**12**
4	33	5	66	10	4	32	4	64	8
5	37	4	74	**8**	5	35	3	70	6
6	40	3	80	6	6	37	2	74	4
7	42	2	84	4	7	38	1	76	2

* os l y, s ass s a l a ro y o a r so r s o a y o o r. or a l , o al a ar al ro o la o r s ass o o ary a y o a al loy .

also ass a la o r a a al ar s l o r so r ar- s a $ a $12, r s ly, a a y a s s ll o ly a $2 r . or o la o r a a al, a r o al r asso a a l l y l ly o al ro y $2 ro r . s a a ar s o ol s a ′. y a l s o al la ar al r ro - o a s ss o la o r a a al as s o ol s a ′, r s ly.

PRODUCING AT LEAST COST

a l as - os o a o o la o r a a al o s ro , say, 0 s o o a s r, a o a y r al a rror, s r s o la o r a o s o a al. ol s 2 a 2′ a a s o a o o la o r a a al o s, , r s l r r 0 (2 + 22) s o o - . o , o ro ol s a ′ a r r s o la o r s s $_L/P_L$, a r o s o a al s s $_C/P_C$ 12 . o, a- o (1) s l ll . o a r y a os s ar a ally rs , s a o al os o loy r s o la o r a o o a al s $ (× $) + (2 × $12) .

r o a o s o la o r a a al ll also y l 0 s o o a a r os a $. or a l , s o la o r a o o a al ll ro 0 (+ 1) s, o al os s r a $ 2 (× $) + (1 × $12) . s r s l o s as os r r s , a s s o la o r a o o a - al ola l as - os r l $_L/P_L$, $_C/P_C$ 1 12. ly o a o (r s o la o r a o s o a al) a s o al os ll sa s y a o (1). ll o r o a o s a a l o ro 0 s o o ola os - r l , a , r or , os or a $.

MAXIMIZING PROFIT

ll 0 so o a r 's ro o, a s ro - a r so a o (2) ar o sa s r loys r so la o r a oo a al. o a ro , a s o l loy l s r als s ar al r ro . or r so la o r, la o r's ol s $12 l s r so ly $ r o l r as s ro y r or la o r. larly, or o so a al, s ol ' a a al's s $1 a s r so ly $12. s r s l a s a or a al s o l also loy . y ro o ly 0 so o (o y ar ro- a l as os), la o r a a al ar s l ss- a - ro - a a o s. r s o a s loy o la o r a a al, r y r as so .

a l 1 - s o s a so la o r a a al ar al o r r s, so a a o (2) s l ll r s loy so la o r a r so a al. s s ro - a o a o o s.[2] r 's o al os ll $, a o $ 0 (× $) o la o r a $ (× $12) o a al. o al r ll $1 0, o r y l ly o al o o (+ 2) y $2 ro r or y s o al r sa r a l o la o r ($) a o a al ($). r o al r a o al os s sa s $ ($1 0 $). r o r o a o so la o r a a - al o o s ra a y y l a o o ro o l ss a $.

o a ro - a o a o o so la o r a r so a al s also a l as - os o a o or s ar lar l l o o . s s r so r a o s sa s s l as - os r r o a o (1) a $_L/P_L$ $^1{}_2$ a $_C/P_C$ 12 $^1{}_2$. (*Key Questions 4 and 5*)

MARGINAL PRODUCTIVITY THEORY OF INCOME DISTRIBUTION

MARGINAL PRODUCTIVITY THEORY OF INCOME DISTRIBUTION The contention that the distribution of income is fair when each unit of each resource receives a money payment equal to its marginal contribution to the firm's revenue (its marginal revenue product).

r s sso o r so r r s or rs o o o ro rs al a a r ss a o o s ar o o o o s o a o a al s o o y. a l 1 - lls s, , a or rs r o ay s (a s) al o ar al o r o s y a o r loy rs' o s a r - s. o r or s, or rs ar a a or o al o la o r s r s a y o r o ro o . larly, o rs o o r r so r s r o as o al o r so r s y s ly ro o ro ss.

s **marginal productivity theory of income distribution**, o s s r - a or o o r o o so y's o . o, yo ar ll o a al ro os o o a a or o a or s r a s, o ay- s as o ar al r ro s o ro a a r a a l s- r o o so y's o .

s a so s a r o , r ar s r o s r s s o s ory o o s r o

---

[2] Because we are dealing with discrete (nonfractional) units of the two outputs here, the use of four units of labour and two units of capital is equally profitable. The fifth unit of labour's MRP and its price (cost) are equal at $8, so that the fifth labour unit neither adds to nor subtracts from the firm's profit; similarly, the third unit of capital has no effect on profit.

- ***Inequality*** r s ar a s r o o o r s l ro ay- a or o ar al ro y ay ly al a s ro- r so r s ar ry ally s r rs la . s ro r r s al a ys al a r s, als o rs - s a ally r o or s o a r ro y ro - a o a ra . o o l ay o a l o ar a ro o a all a s o al or ys al sa l s, a y o l o a o o r a sys o s r o as sol ly o ar al ro y. rs o ro r y r so r s s also ly al. a y la lor s a a al s s o a r ro r y y r a ra r a ro r o ro or . , o ro r ro r y r so r s o s o a a or o a or s r a s a. s r aso alls or o r ol s a o y o s r o s a s r ly a or o ar al ro y.
- ***Market Imperfections*** ar al ro y ory r s s o ass - o so o ar s. la o r ar s, or a l , ar r l r o s, as yo ll s a r 1 . o loy rs r r o r r or rs. so or rs, ro la o r o s, ro s- s o al asso a o s, a o a o al l s la s, l o o oly o r s ll r s r s. ro ss o oll ar a o r a s s s s a o r s r l o r s o o o . s s r l , ar- or s a o s ar s as o ar al ro y ay s o a ro . a o , s r a o la o r ar a s or ar s a r s. s or , a s o r al- orl ar r- o s, a ra s a o r r so r r s r ly ar o as sol ly o o r o s o o .

The LAST word

INPUT SUBSTITUTION: THE CASE OF ATMS

Banks are using more automatic teller machines (ATMs) and employing fewer human tellers.

As you have learned from this chapter, a firm achieves its least-cost combination of inputs when the last dollar it spends on each input makes the same contribution to total output. This raises an interesting real-world question: What happens when technological advance makes available a new, highly productive capital good for which MP/*P* is greater than it is for other inputs, say a particular type of labour? The answer is that the least-cost mix of resources abruptly changes and the firm responds accordingly. If the new capital is a substitute for labour (rather than a complement), the firm replaces the particular type of labour with the new capital. That is exactly what is happening in the banking industry, in which ATMs are replacing human bank tellers.

ATMs made their debut about 30 years age when Diebold, a U.S. firm, introduced the product. Today, Diebold and NCR (also a U.S. firm) dominate global sales, with the Japanese firm Fujitsu a distant third. The number of ATMs and their usage have exploded, and currently more than 26,000 ATMs are used in Canada. We rank number one in the world in ATM use, logging 53 transactions per Canadian in 1997, followed by the United State at 41.4 and Sweden at 37.6. There are now 709,000 ATMs worldwide.

ATMs are highly productive: A single machine can handle hundreds of transactions daily, thousands weekly, and millions over the course of several years. ATMs can not only handle cash withdrawals, but they can also accept deposits and facilitate switches of funds between various accounts. Although ATMs are expensive for banks to buy and install, they are available 24 hours a day, and their cost per transaction is one-fourth the cost for human tellers. They rarely get held up, and they do not quit their jobs (turnover among human tellers is nearly 50 percent per year). ATMs are highly convenient; unlike human tellers, they are located not only at banks but also at busy street corners, workplaces, universities, and shopping malls. The same bankcard that enables you to withdraw cash from your local ATM also enables you to withdraw pounds from an ATM in London, yen from an ATM in Tokyo, and even rubles from an ATM in Moscow. (All this, of course, assumes that you have money in your account.)

In the terminology of this chapter, the more productive, lower-priced ATMs have reduced the demand for a substitute in production—human tellers. Between 1990 and 2000, 6000 human teller positions were eliminated, and half the remaining teller positions may be gone by 2010. Where will the people holding these jobs go? Most will eventually move to other occupations. Although the lives of individual tellers are disrupted, society clearly wins. Society gets cheaper, more convenient banking services and more of the other goods that these freed-up labour resources help to produce.

Source: Based partly on Ben Craig, "Where Have All the Tellers Gone?" *Economic Commentary* (Federal Reserve Bank of Cleveland), April. 15, 1997; and statistics provided by the Canadian Bankers Association.

CHAPTER SUMMARY

1. Resource prices act as a determinant of money incomes, and they simultaneously ration resources to various industries and firms.
2. The demand for any resource is derived from the product it helps produce. That means the demand for a resource will depend on its productivity and on the market value (price) of the good it is producing.
3. Marginal revenue product is the extra revenue a firm obtains when it employs one more unit of a resource. The marginal-revenue-product curve for any resource is the demand curve for that resource, because the firm equates resource price and MRP in determining its profit-maximizing level of resource employment. Thus, each point on the MRP curve indicates how many resource units the firm will hire at a specific resource price.
4. The firm's demand curve for a resource slopes downward, because the marginal product of additional units declines in accordance with the law of diminishing returns. When a firm is selling in an imperfectly competitive market, the resource demand curve falls for a second reason: Product price must be reduced for the firm to sell a larger output. We can derive the market demand curve for a resource by summing horizontally the demand curves of all the firms hiring that resource.
5. The demand curve for a resource will shift as the result of (a) a change in the demand for, and therefore the price of, the product the resource is producing; (b) changes in the productivity of the resource; and (c) changes in the prices of other resources.

6. If resources A and B are substitutable for each other, a decline in the price of A will decrease the demand for B provided the substitution effect is greater than the output effect. But if the output effect *exceeds* the substitution effect, a decline in the price of A will increase the demand for B.
7. If resources C and D are complementary or jointly demanded, there is only an output effect; a change in the price of C will change the demand for D in the opposite direction.
8. The majority of the fastest growing occupations in Canada relate to computers or health care.
9. The elasticity of demand for a resource measures the responsiveness of producers to a change in the resource's price. The coefficient of the elasticity of resource demand is

$$E_{rd} \; \frac{\text{percentage change in resource quantity}}{\text{percentage change in resource price}}$$

When E_{rd} is greater than one, resource demand is elastic; when E_{rd} is less than one, resource demand is inelastic; and when E_{rd} equals one, resource demand is unit elastic.

10. The elasticity of demand for a resource will be greater (a) the more slowly the marginal product of the resource declines, (b) the larger the number of good substitute resources available, (c) the greater the elasticity of demand for the product, and (d) the larger the proportion of total production costs attributable to the resource.
11. Any specific level of output will be produced with the least costly combination of variable resources when the marginal product per dollar's worth of each input is the same—that is, when

$$\frac{\text{MP of Labour}}{\text{Price of Labour}} = \frac{\text{MP of Capital}}{\text{Price of Capital}}$$

12. A firm is employing the profit-maximizing combination of resources when each resource is used to the point where its marginal revenue product equals its price. In terms of labour and capital, that occurs when the MRP of labour equals the price of labour and the MRP of capital equals the price of capital—that is, when

$$\frac{\text{MRP of Labour}}{\text{Price of Labour}} = \frac{\text{MRP of Capital}}{\text{Price of Capital}} = 1$$

13. The marginal productivity theory of income distribution holds that all resources are paid what they are economically worth: their marginal contribution to output. Critics assert that such an income distribution is too unequal and the real-world market imperfections result in pay above and below marginal contributions to output.

TERMS AND CONCEPTS

derived demand, p. 353
marginal product (MP), p. 355
marginal revenue product (MRP), p. 355
marginal resource cost (MRC), p. 356
MRP = MRC rule, p. 356
substitution effect, p. 361
output effect, p. 361
elasticity of resource demand, p. 364
least-cost combination of resources, p. 366
profit-maximizing combination of resources, p. 367
marginal productivity theory of income distribution, p. 369

STUDY QUESTIONS

1. What is the significance of resource pricing? Explain how the factors determining resource demand differ from those underlying product demand. Explain the meaning and significance of the fact that the demand for a resource is a derived demand. Why do resource demand curves slope downward?
2. **KEY QUESTION** Complete the following labour demand table for a firm that is hiring labour competitively and selling its product in a competitive market.
    a. How many workers will the firm hire if the market wage rate is $27.95? $19.95? Explain why the firm will not hire a larger or smaller number of units of labour at each of these wage rates.
    b. Show in schedule form and graphically the labour demand curve of this firm.

c. Now redetermine the firm's demand curve for labour, assuming that it is selling in an imperfectly competitive market and that, although it can sell 17 units at \$2.20 per unit, it must lower product price by 5 cents to sell the marginal product of each successive labour unit. Compare this demand curve with that derived in question 2b. Which curve is more elastic? Explain.

Units of labour	Total product	Marginal product	Product price	Total revenue	Marginal revenue product
0	0		\$2	\$_____	
1	17	_____	2	_____	\$_____
2	31	_____	2	_____	_____
3	43	_____	2	_____	_____
4	53	_____	2	_____	_____
5	60	_____	2	_____	_____
6	65	_____	2	_____	_____

3. **KEY QUESTION** What factors determine the elasticity of resource demand? What effect will each of the following have on the elasticity or the location of the demand for resource C, which is being used to produce commodity X? Where there is any uncertainty as to the outcome, specify the causes of that uncertainty.

   a. An increase in the demand for product X

   b. An increase in the price of substitute resource D

   c. An increase in the number of resources substitutable for C in producing X

   d. A technological improvement in the capital equipment with which resource C is combined

   e. A decline in the price of complementary resource E

   f. A decline in the elasticity of demand for product X due to a decline in the competitiveness of the product market

4. **KEY QUESTION** Suppose the productivity of capital and labour are as shown in the accompanying table. The output of these resources sells in a purely competitive market for \$1 per unit. Both capital and labour are hired under purely competitive conditions at \$3 and \$1, respectively.

Units of capital	MP of capital	Units of labour	MP of labour
0		0	
	24		11
1		1	
	21		9
2		2	
	18		8
3		3	
	15		7
4		4	
	9		6
5		5	
	6		4
6		6	
	3		1
7		7	
	1		½
8		8	

   a. What is the least-cost combination of labour and capital the firm should employ in producing 80 units of output? Explain.

   b. What is the profit-maximizing combination of labour and capital the firm should use? Explain. What is the resulting level of output? What is the economic profit? Is this the least costly way of producing the profit-maximizing output?

5. **KEY QUESTION** In each of the following four cases, MRP_L and MRP_C refer to the marginal revenue products of labour and capital, respectively, and P_L and P_C refer to their prices. Indicate in each case whether the conditions are consistent with maximum profits for the firm. If not, state which resource(s) should be used in larger amounts and which resource(s) should be used in smaller amounts.

   a. $MRP_L = \$8$; $P_L = \$4$; $MRP_C = \$8$; $P_C = \$4$

   b. $MRP_L = \$10$; $P_L = \$12$; $MRP_C = \$14$; $P_C = \$9$

   c. $MRP_L = \$6$; $P_L = \$6$; $MRP_C = \$12$; $P_C = \$12$

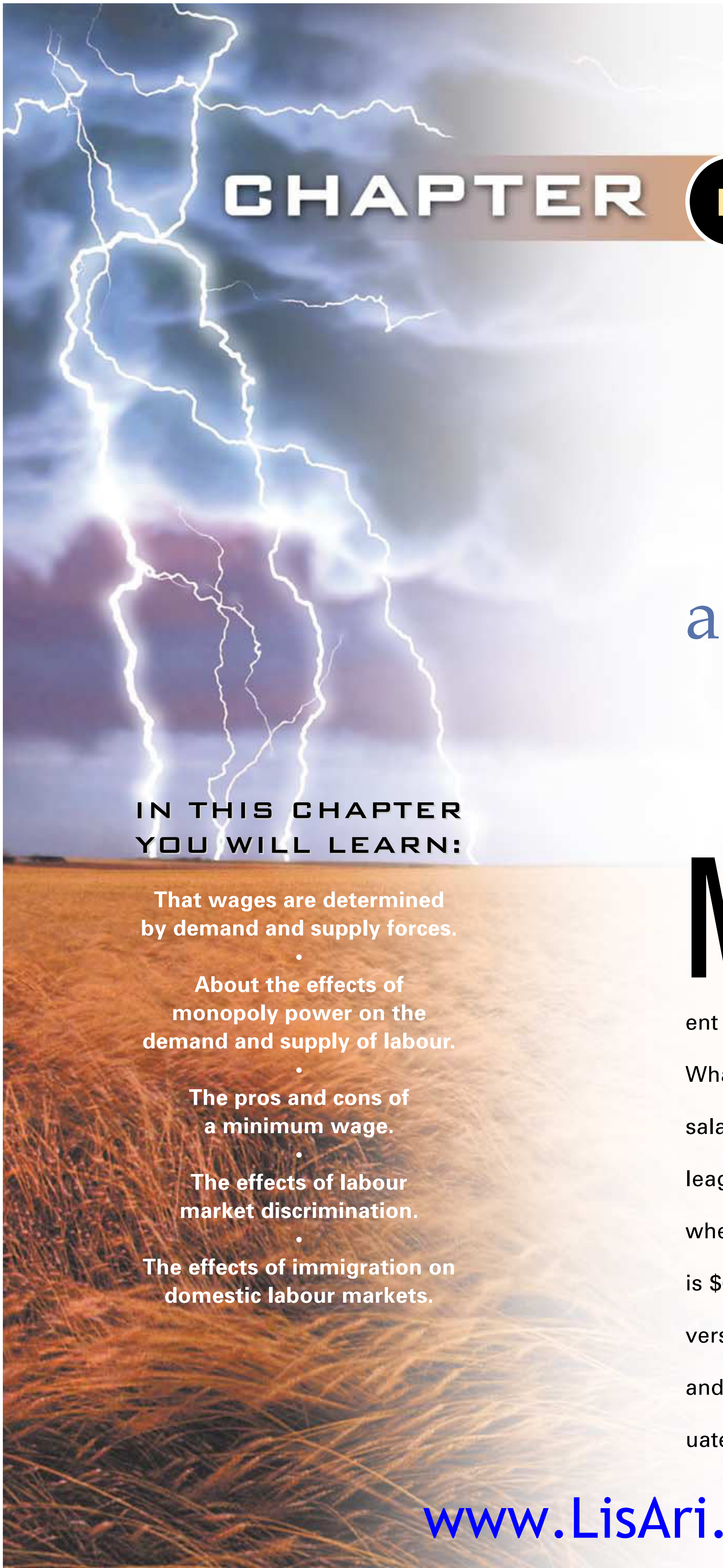
   d. $MRP_L = \$22$; $P_L = \$26$; $MRP_C = \$16$; $P_C = \$19$

6. Florida citrus growers say that the recent crackdown on illegal immigration is increasing the market wage rates necessary to get their oranges picked. Some are turning to \$100,000 to \$300,000 mechanical harvesters known as "trunk, shake, and catch" pickers, which vigourously shake oranges from the trees. If widely adopted, what will be the effect on the demand for human orange pickers? What does that imply about the relative strengths of the substitution and output effects?

7. **(The Last Word)** Explain the economics of the substitution of ATMs for human tellers. Some banks are beginning to assess transaction fees when customers use human tellers rather than ATMs. What are these banks trying to accomplish?

INTERNET APPLICATION QUESTIONS

1. Go to Human Resource and Development Canada at <www11.hrdc-drhc.gc.ca/jf-ea/jf.prospects_by_current1?p_rating=1> to determine the specific employment outlooks for several occupations. For which job are prospects good now but only fair in 2004?
2. Increases in employment reflect increases in labour demand, accompanied by increases in labour supply. Go the Bureau of Labour Statistics at <stat.bls.gov/top20.html> and select International Labour Statistics (at the bottom). Find the percentage increases in employment for the United States, Japan, Germany, France, Great Britain, Italy, and Canada for the most recent 10-year period. Which three countries have had the fastest growth of labour demand, as measured by the employment outcome? which three the slowest?



CHAPTER FIFTEEN

a
r a o ,
s r a o ,
a
ra o

IN THIS CHAPTER YOU WILL LEARN:

That wages are determined by demand and supply forces.

•

About the effects of monopoly power on the demand and supply of labour.

•

The pros and cons of a minimum wage.

•

The effects of labour market discrimination.

•

The effects of immigration on domestic labour markets.

Nearly 15 million of us go to work each day in Canada. We work at an amazing variety of jobs for thousands of different firms for considerable differences in pay. What determines our hourly wage or annual salary? Why is the salary for, say, a top major league baseball player $18 million a year, whereas the pay for a first-rate schoolteacher is $60,000? Why are starting salaries for university graduates who major in engineering and accounting so much higher than for graduates majoring in journalism and sociology?

a lor a or a ors a rl la o r a , o r *labo* *l* oo ra alys s o l a s r s s o s. G rally, la o rs -ly a la o r a ra o r o rly a ra or a al salary a o a o . oll ly, os a sa salar s a a o 0 r o a o al o .

LABOUR, WAGES, AND EARNINGS

NOMINAL WAGE The amount of money received by a worker per unit of time (hour, day, etc.).

REAL WAGE The amount of goods and services a worker can purchase with a nominal wage.

o o ss s r la o r roa ly o a ly o (1) l - ollar a - ollar or rs o all ar s (2) ro ss o al o l s as la y rs, ys a s, - s s, a a rs a ( ) o rs o s all s ss s, l ar rs, l rs, l s o r a r rs, a a os o r a l rs o ro la o r as y arry o r o s ss s.

a s ar r a loy rs ay or la o r. a s ay a or o salar s, o s s, royal s, or o ss o s. ll s r a s o a a ra r o r, r ay, a so or . a sa ll r s a a a ra s a r a r o la o rs r s. ll also l s s s a ra a la o r ar s, la r r y l ly r o o rs or r , r o , or r y ar y o rly a or a ra .

s also s s o al a s a r al a s. **nominal wage** s a o o o y r r o r, r ay, a so o . **real wage** s a y o oo s a s r s a or r a o a o al a s r al a s r al r as o r o o al a s.

<www.internationalecon.com/v1.0/ch40/40c200.html> The real wage effects of free trade

o r r al a s o yo r o al a a r s o oo s a s r s yo r as . os yo r a r r as yo r o al a r a r a y ar, a sa y ar r l l r as s y r- . yo r r al a as r as y r (r *min* r). l ss o r s a , ll ass a o rall l l o r s r a s o s a . o r or s, ll s ss o ly *eal* a s.

GENERAL LEVEL OF WAGES

a s r a o a o s, r o s, o a o s, a als. a ra s ar r a a a a a or a. a s ar sl ly r so a s o a a a a or . l rs ar a l ss a o y lay rs, a la y r a ay ar as as la y r ar or sa r o o rs o or . a ra s also r y r, ra , a a ro .

ral, or a ra , l l o a s, l ral l l o r s, l s a ra o r a ra s. l s a s o a rs, ar rs, r aso s, a ra s r o s. y a ra s a s, a or as ly o ar a s a o r o s a a o a o s.

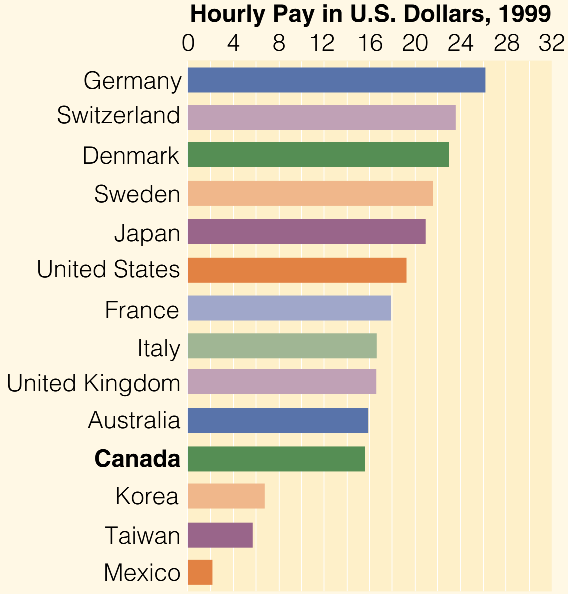
s Glo al rs 1 .1 s s s, ral l l o r al a s a a a s r la ly al o o s orl .

s l s la a o or r al a s a a a a o r s r-ally a a o o s (r rr o r a r as a a o o s) s a a or la o r s a o s s r la ly lar o ar o s ly o la o r.

GLOBAL PERSPECTIVE 15.1

Hourly wages of production workers, selected nations

Wage differences are pronounced worldwide. The data shown here indicate that hourly compensation in Canada is not as high as in some European nations. It is important to note, however, that the prices of goods and services vary greatly among nations, and the process of converting foreign wages into dollars may not accurately reflect such variations.



Source: U.S. Bureau of Labor Statistics, <stat.bls.gov>, 2000.

The Role of Productivity

o ro r o s a r a a or la o r, or or a y o r r so r , s o s ro y. G rally, r a r ro y o la o r, r a r a or . o al s ly o la o r s , s ro r a or la o r, r a ra l l o r al a s. a or la o r a a a a o r a or a a o o s s lar a s la o r s o r s s ly ro . r ar s ral r aso s or a ro y

- *Plentiful capital* or rs a a o o s a a ss o lar a o s o ys al a al (a ry a l s). o al ys al a al r or r a a a s o o s orl .
- *Access to abundant natural resources* a a o o s, a ral r so r s o a a r la o o s o la o r or . o o os r so r s ar a a la l o s ally a o rs ar or ro a roa . a a a, or a l , s r ly o ara l la , ral r so r s, a so r s o r y or s ry.
- *Advanced technology* l l o olo al ro r ss s rally a a o o s. o o ly o or rs s o o s a or a al o or a s also olo ally s r or o a a la l o as a or y o or rs orl . or o s a a o o s ar s a ly ro ro s s y a r s ar .

- ***Labour quality*** al , o r, a o , a ra o or rs a a o o s ar rally s r or o os lo a o s, a s a , sa a y a al y o a ral a a - al r so r s, or rs a a o o s o or a a y o r or o r ar s.
- ***Intangible factors*** ss a l a ors also ay rl ro - y so o a a o o s. a a a, or a l , s a - ors l (1) y a l y o a a (2) s ss, so al, a ol al ro s a as ro o a ro - y a ( ) as s o o s ar , a l s r s o a ass ro o .

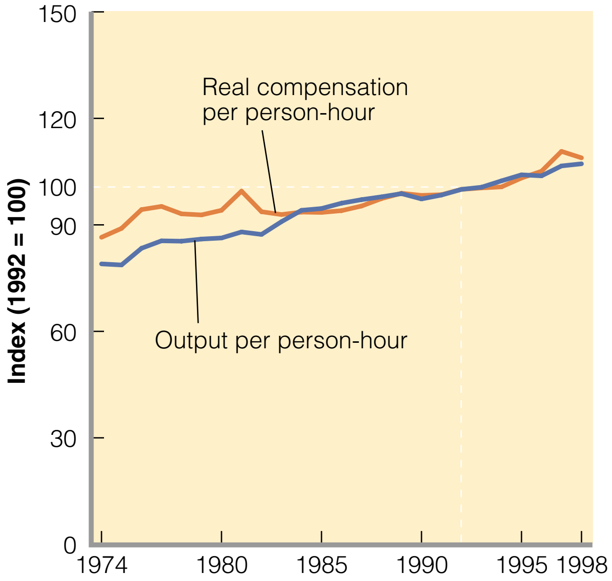
Real Wages and Productivity

r 1 -1 s o s los lo -r r la o s o r o r o or a r al o rly ar s a a a. a s r al o a r al o ar o ays o sa , r al o (ar s) r or r a r as o ly a a o sa ra as o r or r. or rs ro or r al o r o r, or r al o s a a la l o s r o or a o r or .

r al orl , o r, s l rs o la , a al, a r r r al al also s ar o ro ro o . al a s, r or , o o al ays r s lo s a s ro y o r s or s a s o . o r lo r - o s, ro y a r al a s o r s o r.

FIGURE 15-1

Over the years a close relationship exists between output per hour of work and real hourly earnings.



Source: a s s a a a.

Secular Growth of Real Wages

as s ly a a a alys s l s la lo - r r o r al- a ro a a a. a o 's la o r or as ro s a ly o r a s, , as a r s l o ro y- r as a ors a o , la o r a as r as or ra ly a la o r s ly. r 1 -2 s o s s ral s r as s la o r s ly a la o r a . r s l as a lo -r , or s lar, r as a ra s a loy .

A PURELY COMPETITIVE LABOUR MARKET

Choosing a Little More or Less

PURELY COMPETITIVE LABOUR MARKET A resource market in which a large number of (noncolluding) firms demand a particular type of labour supplied by a large number of nonunion workers.

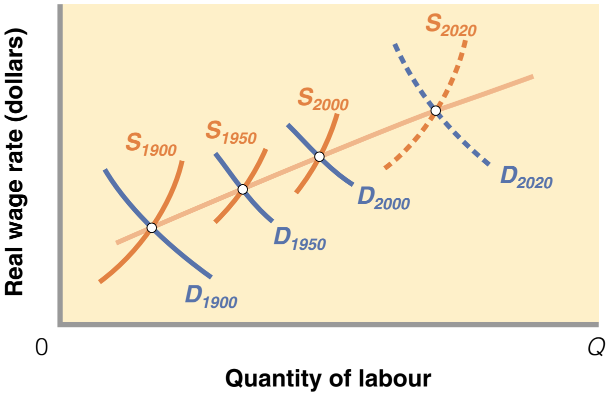
o r ro a ra l l o a s o s a ra s. a r- s a ra a or so s y o la o r a a s ly a alys s a a r al . 's y a la o r a a la o r s ly a **purely competitive labour market**. s y o ar

- a y r s o o a o r r a s y o la o r.
- a o ro s al or rs al s lls s l s a y o la o r.
- al r s a al or rs ar a - a rs, s r a r a y o rol o r ar a ra .

Market Demand for Labour

os 200 r s a a ar lar y o la o r, say ar rs. s r s o sa s ry s r s ar a or o ro s y ro a o r so r s y loy. s, r s ro oo - ra r r , oo o s a oors, o s s a a ar l s, a oo a s ll a ar rs. o o al, or ar , la o r a r or a ar lar la o r s r , s or o ally la o r a r s (ar al r ro r s) o al r s, as a **igure 15- (ey Graph).** or o al s o 200 la o r a r s l *d* r 1 - ( ) y l s ar la o r a r *D* r 1 - (a).

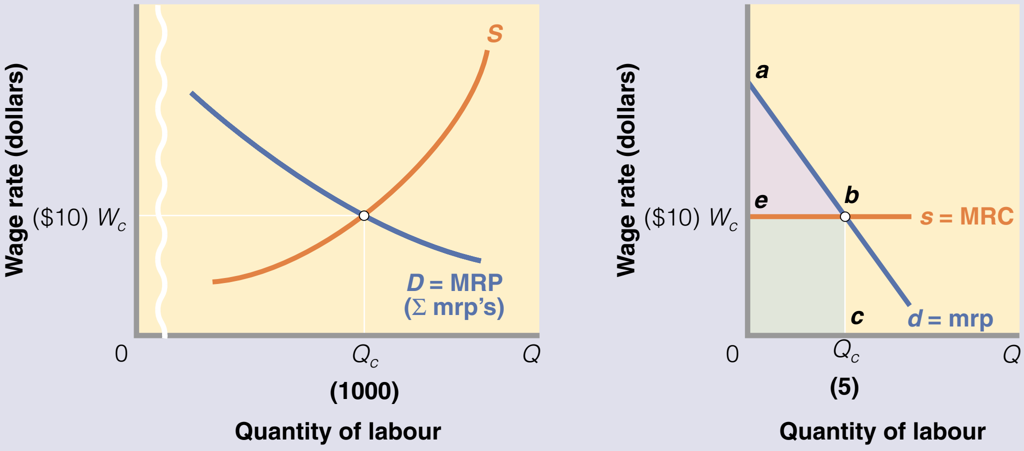
FIGURE 15-2



The productivity of Canadian labour has increased substantially over the long run, causing the demand for labour, *D*, to shift rightward (that is, to increase) more rapidly than increases in the supply of labour, *S*. The result has been increases in real wages.

Key Graph

FIGURE 15-3 LABOUR SUPPLY AND LABOUR DEMAND IN (PANEL A) A PURELY COMPETITIVE LABOUR MARKET AND (PANEL B) A SINGLE COMPETITIVE FIRM



(a) Labour market

(b) Individual firm

In a purely competitive labour market (panel a), the equilibrium wage rate, W_c, and the number of workers, Q_c, are determined by labour supply *S* and labour demand *D*. Because this market wage rate is given to the individual firm (panel b) hiring in this market, its labour supply curve *s* = MRC is perfectly elastic. Its labour demand curve is its MRP curve (here labelled *mrp*). The firm maximizes its profit by hiring workers up to where MRP = MRC. Area 0*abc* represents both the firm's total revenue and its total cost. The green area is its total wage cost; the lavender area is its nonlabour costs, including a normal profit—that is, the firm's payments to the suppliers of land, capital, and entrepreneurship.

QUICK QUIZ

1. The supply of labour curve *S* slopes upward in graph (a) because

a. the law of diminishing marginal utility applies.
b. the law of diminishing returns applies.
c. workers can afford to buy more leisure when their wage rates rise.
d. higher wages are needed to attract workers away from other labour markets, household activities, and leisure.

2. This firm's labour demand curve *d* in graph (b) slopes downward because

a. the law of diminishing marginal utility applies.
b. the law of diminishing returns applies.
c. the firm must lower its price to sell additional units of its product.
d. the firm is a competitive employer, not a monopsonist.

3. In employing five workers, the firm represented in graph (b)

a. has a total wage cost of $6000.
b. is adhering to the general principle of undertaking all actions for which the marginal benefit exceeds the marginal cost.
c. uses less labour than would be ideal from society's perspective.
d. experiences increasing marginal returns.

4. A rightward shift of the labour supply curve in graph (a) would shift curve

a. *d* = mrp leftward in graph (b).
b. *d* = mrp rightward in graph (b).
c. *s* = MRC upward in graph (b).
d. *s* = MRC downward in graph (b).

Answers

1. d; 2. b; 3. b; 4. d

Market Supply of Labour

s lys o a r ly o la o r ar , ass a o o s s a a or rs ally o or a a la l o s. s ly r or a y o la o r slo s ar , a a loy rs as a ro s ay r a ra s o o a or or rs, a s y s or rs a ay ro o r s r s, o a o s, a lo al s. l s, or rs a al r-a o o or s or a l , y ay or o r s r s sa lo al y, or y ay or r r s o a o s r s or ro s, or y ay or o r o a o s.

r s a a o r s or rs (r , ar rs) s ay r a ra s o a ra a ay ro al r a o o or s a a la l o . y s also ay r a s o o l o ar o rr ly la o r or r a s o o s ol a s or oy l s r o s loy . s or , ass a a s ar o s a o r la o r ar s, r a s a ar lar la o r ar or or rs o o r r la o r s r s a ar a a o r y ar -slo ar s ly o la o r r S r 1 - (a).

Labour Market Equilibrium

rs o o ar la o r a r a ar s ly r r l r a ra a l l o loy r ly o - la o r ar s. r 1 - (a) o l r a ra s W_c ($10), a r o or rs r s Q_c (1000). o al r ar a ra W_c s . a o a y r s loys s a s all ra o o o al a a l-a l s ly o s y o la o r a o o a a ra . s ly o s la o r s r ly las o al r , as s o y or - o al l r 1 - ( ).

a al r ll ro a l o r s y o la o r o o a ar al r ro s al o ar al r so r os . s s r ly a a l a o o r l lo a r 1 .

s a l 1 -1 a s, r o a r so r s o al o r , ar al os o a r so r ( ) s o s a a s al o r so r r . r , s o s a a s al o a ra . a a o al or r r a s r - s ly s or r o a ra ($10 s as) o r 's o al r so r os . o r a r ly o la o r ar a s s ro y r or rs o o a s a ra als . r 1 - ( ) s r ll r $_c$ ( ) or rs, ay a o ar a ra , W_c ($10). o, oo, ll o r 1 r s (o s o) a ar r- or rs s la o r ar . o r a r 's o al r ro loy a ar lar r o la o r s, s s o os s. or a l , a r loys r la o r s ar al

TABLE 15-1 THE SUPPLY OF LABOUR: PURE COMPETITION IN THE HIRE OF LABOUR

(1) Units of labour	(2) Wage rate	(3) Total labour cost (wage bill)	(4) Marginal resource (labour) cost
0	$10	$ 0	
1	10	10	$10
2	10	20	10
3	10	30	10
4	10	40	10
5	10	50	10
6	10	60	10

r ro so $1 , $1 , a $12, r s ly, r 's o al r s $ ($1 + $1 + $12). r 1 - ( ), r ar o r s r o ol s o la o r, o al r s r r s y ar a 0*abc* r r o l o $_c$. a ar ar r s s r 's o al os , l a or al ro or $_c$ s, sa ar a 0*abc*. r r a l r r s s r 's o al a os (0 $_c$ × 0W_c). la r r a l (o al r s o al a os) r r s s r 's o la o r os s s l a l ay s o la , a al, a r - r rs . s, s as , o al os (a s l s o r o ay s) als o al r . s r a o rs l ar ar o ly a or al ro . r 1 - ( ) r r s s a lo -r l r or a r a s s ll s ro a r ly o ro ar a y s la o r a r ly o la o r ar . (*Key Questions 3 and 4*)

MONOPSONY MODEL

r ly o la o r ar s r r s o , a loy r r s oo s all a a o o la o r o a ra . a r a r as l l or as la o r as s o ly a ar a ra , as r s or o al la o r s ly r . s a o s r **monopsony**, a ar a s l loy r o la o r as s s a al y (r) o r. a o r ar o o so y as ollo ara r s s

MONOPSONY A market structure in which there is only a single buyer of a good, service, or resource.

- ly a s l y r o a ar lar y o la o r s s.
- s y o la o r s r la ly o l , r o ra ally or a s or rs o l a o a r s lls.
- r s a a - a r, a s a ra s ay ar s r ly r o or rs loys.

s s r o o o oly o r, r ar ar o s r s o o o so y o r. *e* o o so y s o r s a s a , a s o ly a s l loy r s s la o r ar . s r al- orl a l s ar ro a ly la o r ar s so o s a al os r ly o o a or r . or a - l , a o r- o r ay al os o ly so r o loy a r o r s ol a o . l ll 's as r o s s, a Ga a a r ll, or a o la s ro ssor ay ro os o loy s lo al . o (lar s l ro r orl) s a o - a loy r ry, ar o, ar a.

o r as s r or o r r s ay a r a lar or o o s ly o la o r a r a ar a , r or , a so o o so y o r. y a - ly or o ly a o r r la o r, y r a ly a r o o so y o r.

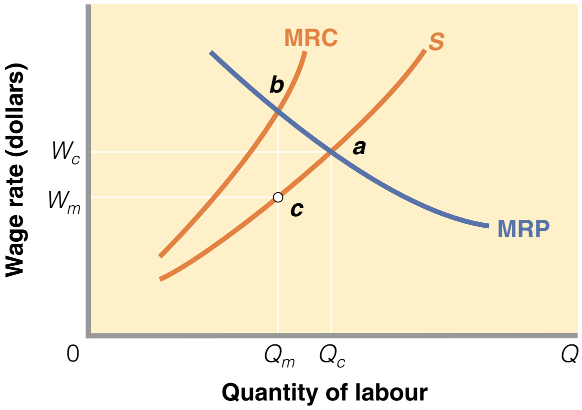
<www.idg.net/crd_monopsony_307867_103.html> What is monopsony?

Upward-Sloping Labour Supply to a Firm

a r r s os o a a la l s ly o a ar lar y o la o r, s s o o loy or or r or rs a s a ra ays o os or rs. ally, a r s lar r la o o s o la o r ar , ll a o ay a r a ra o o a or la o r. os o ly o loy r o a ar lar y o la o r s s a r a o ra ar a. a r as , la o r s ly r or a r a o al s ly r or la o r ar ar al. s s ly r s ar slo , a a

FIGURE 15-4 THE WAGE RATE AND LEVEL OF EMPLOYMENT IN A MONOPSONISTIC LABOUR MARKET

In a monopsonistic labour market, the employer's marginal resource (labour) cost curve (MRC) lies above the labour supply curve, *S*. Equating MRC with MRP at point *b*, the monopsonist hires Q_m workers (compared with Q_c under competition). As indicated by point *c* on *S*, it pays only wage rate W_m (compared with the competitive wage W_c).



r s ay a r a ra o a ra or or rs. s ly r , *S* r 1 - , s also a ra - os -o -la o r r or r a o o a s a ra (os) r or r a s a o a ra orr - s o r o or rs.

MRC Higher than the Wage Rate

a o o so s ays a r a o a ra a a o al or r, s ay a r a o all or rs s rr ly loy a a lo r a . o , la o r oral ll r ora , a loy r ll la la o r r s a s o a -ra r s or sa o . ay a or a o all or rs a s a os o a ra or r ar al r so r (la o r) os ( ) s s o a or r's a ra a a o ssary o r a ra o all rr or rs o a l l.

a l 1 -2 ll s ra s s o . or r a r a a a ra o $, r a s o or r or s r o ay a r a ra o $. ar al r so r (la o r) os o s o or r s $ $ a o s o or r l s a $1 ra s or rs or r. ro a o r o , o al la o r os s o $1 (2 × $), ro $. o o s o or r s $ ($1 $), o s $ a ra a o a or r. - larly, ar al la o r os o r or r s $10 $ a s a o a ra s or r ro al r a loy , l s $1 ra s s, ro $ o $, or rs o or rs.

TABLE 15-2 THE SUPPLY OF LABOUR: MONOPSONY IN THE HIRE OF LABOUR

(1) Units of labour	(2) Wage rate	(3) Total labour cost (wage bill)	(4) Marginal resource (labour) cost
0	$ 5	$ 0	
1	6	6	$ 6
2	7	14	8
3	8	24	10
4	9	36	12
5	10	50	14
6	11	66	16

or a o s a o o o so s , ar al r so r (la o r) os s a ra . Gra ally, r l s a o a ra - os -o - la o r r , or la o r s ly r S, as s l arly s o r 1 - .

Equilibrium Wage and Employment

o a y s o la o r ll o o so s r a a a ra ll ay o a ro , o o so s ll loy a y o la o r Q_m r 1 - , a s a a a y a ar al (o b).[1] o o so s r s o s ay o a ra s Q_m or rs. ro s ly r S, s ally o c, s s a s ay a ra W_m. l arly, o ay a a al o a a ra a ly r o or rs a s (Q_m) a ra W_m. a ra s a ll ay. o ras s r s l s os a o l r a l a o la o r ar- . o o r o la o r, l l o loy o l r a r (a Q_c) a a ra o l r (a W_c). r s al, o o so s a s s ro y r a s all r r o or rs a r y ay a l ss- a - o a ra .[2] o y s a s all r o , a or rs a a ra a s l ss y bc a r ar al r ro . s as a o o ol s s ll r s ro a l o r s r ro o o r al a a o - o r or s oo s, o o so s loy r o r so r s s ro a l o r s r loy o r ss a ra s a r or os s a s, o r al a ra s lo os a o l o r r o - o o s.

Examples of Monopsony Power

o o so s la o r ar s ar o o o a a a o o y, s or y ally, a y loy rs o or or rs, ar larly or or rs o ar o a o ally a o ra ally o l . lso, r o o so y la o r

---

[1] The fact that MRC exceeds resource price when resources are hired or purchased under imperfectly competitive (monopsonistic) conditions calls for adjustments in Chapter 14's least-cost and profit-maximizing rules for hiring resources. (See equations (1) and (2) in the "Optimal Combination of Resources" section of Chapter 14.) Specifically, we must substitute MRC for resource price in the denominators of our two equations. That is, with imperfect competition in the hiring of both labour and capital, equation (1) becomes

$$\frac{\text{MP}_L}{\text{MRC}_L} = \frac{\text{MP}_C}{\text{MRC}_C} \tag{1'}$$

and equation (2) is restated as

$$\frac{\text{MRP}_L}{\text{MRC}_L} = \frac{\text{MRP}_C}{\text{MRC}_C} \tag{2'}$$

In fact, equations (1) and (2) can be regarded as special cases of (1′) and (2′) in which firms happen to be hiring under purely competitive conditions and resource price is, therefore, equal to, and can be substituted for, marginal resource cost.

[2] This situation is analogous to the monopolist's restricting output as it sets product price and output based on marginal revenue, not product demand. In this instance, resource price is set on the basis of marginal labour (resource) cost, not resource supply.

[3] A monopsonistic employer may or may not be a monopolistic seller in the product market. The Quebec textile mill may be a monopsonistic employer yet face severe domestic and foreign competition in selling its product. In other cases—for example, the commercial aircraft and professional sports industries—firms have both monopsony and monopoly power.

ar o o s o r s o r, o s s r o o ra a o r y or r s o o a a s. r l ss, o o s s a o o o o so y o r s rs la o r ar s as ar s or rs s, ross o al a l s, l -s ool a rs, s a r loy s, a so l ra s or rs.

as o rs s, a or loy rs os lo al s ar a r la ly s all r o os als. r r, ly s al s lls o rs s ar o r a ly ra s ra l o o r o a o s. as o , a or a o oso y o l, a , o r s al, s all r r o os als a o or y (a s, r a r r o o o so y), lo r s ar salar s o rs s.

<www.bcnu.org/backgrounder1.htm> Nurses' opening demands in new collective agreement

ro ss o al s or s l a s also ro a oo a l o o o so y, ar larly as r la s o ay o rs -y ar lay rs. a o al o y a , a o al as all sso a o , a a or a as all ass rs -y ar layrs o a s ro lay r ra s. a ro s o r a s ro o or lay r's s r s, a l as or s ral y ars, l lay r o s a r a . s ay l a r s s o o so y o r, r s l s lo r salar s a o l o r r o o o s. (*Key Question 6*)

QUICK REVIEW

- Real wages have increased historically in Canada because labour demand has increased relative to labour supply.
- Over the long term, real wages per worker have increased at approximately the same rate as worker productivity.
- The competitive employer is a wage-taker and employs workers at the point where the wage rate (= MRC) equals MRP.
- The labour supply curve for a monopsonist is upward sloping, causing MRC to exceed the wage rate for each worker. Other things equal, the monopsonist, hiring where MRC = MRP, will employ fewer workers and pay a lower wage rate than would a purely competitive employer.

THREE UNION MODELS

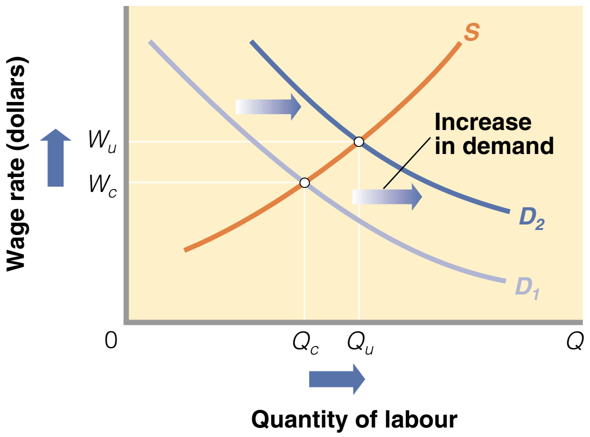
a ass so ar a or rs o o a o r s ll r la o r s r s. so la o r ar s, o r, or rs s ll r la o r s r s oll ly ro o s. a o s or a o r s o la o r ar , ar a s a r la ly lar r o loy rs. o as a y oals, os or a o s o ra s a ra s, a a rs a o s ral ays.

Demand-Enhancement Model

ro o 's o , os s ra l or ra s a ra s s o r as a or la o r. s r 1 - s o s, a r as la o r a ll r a o r a ra s a or o s. o r a os r as s ll s o las y o la o r s ly. l ss las la o r s ly, r a r ll a r as or las la o r s ly, r a r ll loy r as .

FIGURE 15-5 UNIONS AND THE DEMAND FOR LABOUR

When unions can increase the demand for labour (say, from D_1 to D_2), they can realize higher wage rates (W_c to W_u) and more jobs (Q_c to Q_u).



o r as la o r a o al r o or or o r a s o a . or a l , a o a a o r as a or ro - or s r s rs ar ro , a ro y o la o r, or al r r s o o r s.

INCREASE PRODUCT DEMAND

o r as a or ro s r rs l ro a s o r as r a or la o r s r s o s ay r sor o a r s , ol al lo y , or r r loy rs o r r a la o r.

o ay a s a s la y o s r o s rs o loo or o la l. o as o , o s a o loy rs o a a r s a - a s s o ols r a or ro s r rs l o ro . o s a a a a l o a y o a a s o o o - s rs o r as ro s a y r rs.

ol al ro o s r o o s a lo or ay, ass ra s , a s a ro s. a rs' o s a asso a o s a s or r as l s o a o , a s l or rs' o as a s s or loy rs s ro ar s s o l o or s l. s l or rs r o a a r as r o or s l ro ar s or r a o al a r s ll r as a or ly s s a l o s ally a s l, oos r a or a a a s l or rs.

INCREASE PRODUCTIVITY

a y s o s a la o r ro y or a l , s o s o r a y a al y o r al a al s y or rs ar a la rally y a a . r s a ro y, o r, o s o la o r a a o s s o r as la o r ro y.

RAISE THE PRICE OF OTHER INPUTS

o s so s a r o s r a or r la o r y or o r as r o s s r so r s. or a l , al o o rs ar rally a s a ly or a a , o s a s ro ly s or r as s a . r os ay o ra s r o lo - a , o o la o r, so as s s s s a l or o la o r. r a or o o or rs ll s o ra loy rs ro s s s or rs or o or rs a ll r y ols r a or o rs.

larly, o s a so s so o r as a or r la o r ys or l a o s a r r o a o l ary r so r . or a l , o s s r s a s lar a o s o r y o os ra r as s ro os y l r or a ral as l s. r la o r a r y ar o l ary, a r r as or r y r a or la o r ro a r 1 ’s o .

o s r o a ra l y o a or la o r s ry l - . o s ly y ar or l ly o ry o r l s la o r a a y ar o ro o r as s. o, s o s r r s a o or s o ra s a ra s a o ra o s ly s o la o r ar .

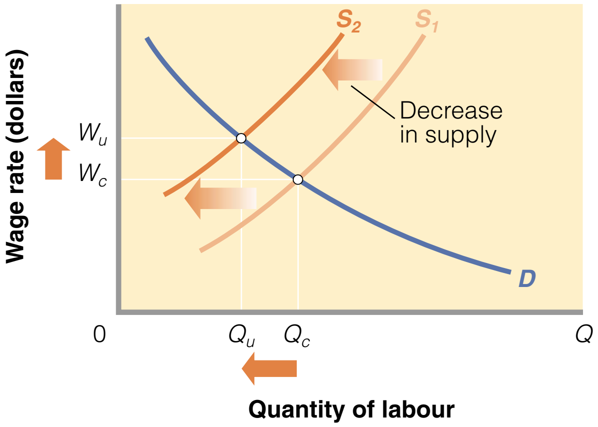
Exclusive or Craft Union Model

ay o s a oos a ra s s o r s ly o la o r, a o r y ars or a la o r as a o r ol s o o s a . or a l , la o r o s a s or l sla o a as (1) r s r ra o , (2) r l la o r, ( ) o ra o lsory r r , a ( ) or a s or r or .

or o r, r a y s o or rs a a o s s o r s r r o or rs o a o r o . s s s ally r o *c af nion* , os rs oss ss a ar lar s ll, s as ar rs or r aso s or l rs. ra o s a r ly or loy rs o a r o r o ly o rs, r y a r ally o l o rol o la o r s ly. , y ollo r s r rs ol s or a l , lo a r s s, ry a o s, a l s o r o rs a y ar - ally r s r la o r s ly. s a r 1 - , s ra s r s l r a ra s a o s a s all **exclusive unionism**. y l

EXCLUSIVE UNIONISM The practice of a labour union of restricting the supply of skilled union labour to increase the wages received by union members.

FIGURE 15-6



By reducing the supply of labour (say, from S_1 to S_2) through the use of restrictive membership policies, exclusive unions achieve higher wage rates (W_c to W_u). However, restriction of the labour supply also reduces the number of workers employed (Q_c to Q_u).

or rs ro o s a r or ro la o r s ly, ra o s s l a a ra s.

OCCUPATIONAL LICENSING The laws of provincial or municipal governments that require a worker to satisfy certain specified requirements and obtain a licence from a licensing board before engaging in a particular occupation.

Occupational licensing s a o r a s o r s r s ly o s s o la o r. r a ro o or rs a o a o r ss r ro al or - al o r s o ass a la a says a so o a o al ro (or a l , ar rs, or ys a s, l rs, os olo s s, ra rs, s o roll rs) a ra s r ra o ly y r a r r s. os r r s l l l o a o , a o o or r , ass o a a a o , a rso al ara r s s (ra o r s o oo oral ara r). rs o l s o a o y ally o a l s oar a a s rs s la s. r s l ss l -r la o , o l a s o ol s a s r o ly or s r ry o o a o a r la o r s ly. r os o l s s s os ly o ro o s rs ro o ra o rs s r ly a or y oal. s l s also r s l s a o - o a s a ar s or os l s o a o (r 1 -). or o r, l s r r s o l a r s y r r , s r ro al o o al or rs. o 00 o a o s ar o l s a a a.

Inclusive or Industrial Union Model

s a o ry o l r rs , o r, os o s s o or a all a a la l or rs. s s s ally r o *ind ial nion* , s as os o a o o l or rs a s l or rs. o s s as rs all a a l- a l s ll , s s ll , a s ll or rs a s ry. o a a or o l s s rs ar s ll ra rso s or o r ar s s s. or a o o os o s ll a s s ll or rs, a ol- y o l rs o l a a a la l o loy rs ro s o o or rs o ar ly s s a l or o or rs. s r al o a l s r ally all a a la l or rs s r- s a r s r r a r ss r o a r o s a a s. a s o s l al r o s r , s a o a r a o r r s o r r la o r s ly, a a a al s r a o s a .

<www.amfanow.org/craft.htm> Craft union or industrial union?

INCLUSIVE UNIONSIM The practice of a labour union of including as members all workers employed in an industry.

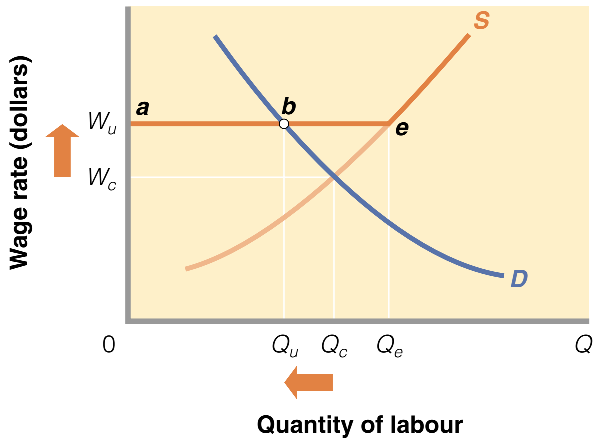
ll s ra s **inclusive unionism** r 1 - . ally, o l r a ra s W_c a l l o loy s Q_c. o s os a s r al o s or a a s a r, a o - l r a ra o , say, *W* . a a ra *W* o l r a a r ly las la o r s ly o r ra *ae* r 1 - . r s a o r a y or rs s ra , y o l a o ay o - os a ra . y a a s s a a , o ll s ly o la o r a all, a r s ll a a s r . r s s r o ay r a ra a o s r a s r , y ll a o loy ro Q_c o *Q* .

y a r o o ' s *W* a a , al loy rs o a - a rs. a s la o r s ly s r ly las o r ra *ae*, ar al r so r (la o r) os s al o a ra *W* o r s ra . *Q* l l o loy s r s l o loy rs' a s (o al o a ra) , a or o o r ro - a r 1 .

o ro o *e* o la o r s ly r *S* a Q_e or rs s r loy a a *W* . as a y o *b* o la o r a r *D*, o ly *Q* or - rs ar loy . r s l s a s r l s o la o ro Q_e *Q* (also s o y s a *eb*). a r ly o la o r ar o o , o a s r l s

FIGURE 15-7 INCLUSIVE OR INDUSTRIAL UNIONISM

By organizing virtually all available workers to control the supply of labour, inclusive industrial unions may impose a wage rate, such as W_u, which is above the competitive wage rate W_c. The effect is to change the labour supply curve from S to aeS. At wage rate W_u, employers will cut employment from Q_c to Q_u.



o loy or rs o l lo r a s. ally, a ra o l all o l r l l, W_c, r a y o la o r s l als a y o la o r a (a Q_c). s ro a s o s o a , a s or rs ar a oll ly ro r o . al or rs a o o r o or or l ss a W or a loy rs ay l ss a a .

Wage Increases and Unemployment

a o s s ss l ra s a s o r rs s-s s a o rs o a ra a a 10 o 1 r a a a a o r o o or rs.

s r s 1 - a 1 - s s , o a -ra s a o s a y o l s a l s o s s o r loy . o 's s ss a a o - l r a ra s s s o a o a y a l r o or rs loy . a r s l a s as a r s ra - o o a a s. o a o o a a sol ar y s ra s a s a a ra so a o l ss ss ll r s l or, say, 20 or 0 r o s rs.

loy r a y o - a r as s ay r o ays

1. ***Growth*** or al ro o o o y r as s a or os s o la o r o r . s o al r ar s o la o r a r s r s 1 - a 1 - o s , or or a o s , loy-s asso a a a r as s. a , r as s loy ro y o s o l o *lo* ro o o o or s o l o r o al loy y r s.

2. ***Elasticity*** s o loy r s l ro a o-a r as s o las y o a or la o r. or las-a a , s all r a o o loy a a o a s a a -ra r as . o s a s ar a s r , y ay a l o ro s o s r oll ar a a r s a

r las y o a or o la o r y r s s a l- y o o r s or a la o r. or a l , a o ay or loy rs o a r l s slo ro o o a ry a . r o ay ar a s ss lly or s ra ay or layo ay, r as s os o r o s s a al or la o r a ra s ar r as . larly, o ay a a o ra ro s o ro r ro s o ra ro o o o o (lo r- a) r s or ro r lo- a or o lo - a or rs o rs as, r y r s r s s o o a r la o r or o or rs.

BILATERAL MONOPOLY MODEL

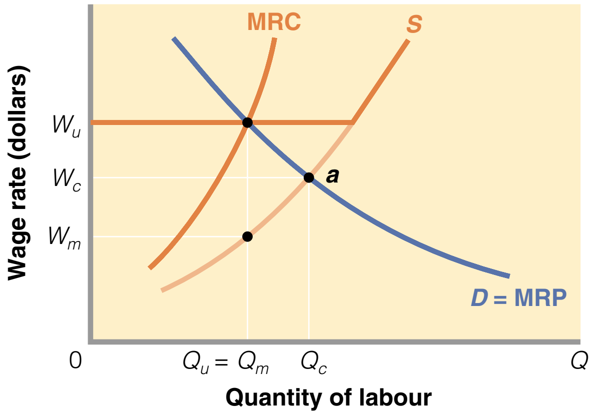
BILATERAL MONOPOLY A market in which there is a single seller (monopoly) and a single buyer (monopsony).

os a s ro s r al o s or a la o r ar a s o o so - s ra r a o , r a a o a o o o o so y o l a l s o s o l. r s l s all **bilateral monopoly** a s s r or r s a s l s ll r a a s l y r. o s a o o ol s s ll r o la o r a o rols la o r s ly a a a ra s, a s a o o so s y r o la o r a a also a a s y al r s loy . s s o a o o as , ar larly l ss- r or s a s l o o ro s o, r , or o r lar loy rs, s as s l, a o o l s, o s r o , ro ss o al s or s, a o r al a r ra .

Indeterminate Outcome of Bilateral Monopoly

ss a o ss o r 1 - , r s r os r 1 - o o - r 1 - . o o so s loy r ll s lo - o - l r a ra W_m, a o r s a ly ll r ss or so a o - o - l r a ra s as W . ll o o a o say r a y. o o s lo ally r a a s la ral o o oly o l o s o la a ll a a oll ar a a l . a a o o o l so r W_m a W . yo a , a o all a say s a ar y r a r ar a o r a or ar a s ra y ll ro a ly a a los r o o s s.

FIGURE 15-8



A monopsonist seeks to hire Q_m workers (where MRC = MRP) and pay wage rate W_m corresponding to Q_m labour on labour supply curve *S*. The inclusive union it faces seeks the above-equilibrium wage rate W_u. The actual outcome cannot be predicted by economic theory.

Desirability of Bilateral Monopoly

a a loy o o s ss a o or so ally s r- a l a r la ral o o oly l s. o o oly o o s o ar a l o o o oly o o r s , y l o - or ar- o r s l s. r o or a a r a l s ar a s, a al a ra r r a r W or W_m loy o l r s r o Q_m (r), s lo o l l.

o s os o o oly o r o o ro ly o s s o o - so y o ro a a , a o a a a a r o a ra W_c, s o a . a a a s s a ra , s - o r s r loy sa ars o lo r a r ss a ra s y r s r loy . s a , a a r s a os ro a l r so r a y, r ar a a ra W_c (s o r ’s) s al o . r s Q_c or rs. s, o o oly o o s s o la o r ar , r s l a ra a l l o loy ay los r o o - l ls a o l as o o oly s o o ly o s o ar- . (*Key Question 7*)

QUICK REVIEW

- In the demand-enhancement union model, a union increases the wage rate by increasing labour demand through actions that increase product demand, raise labour productivity, or alter the prices of related inputs.
- In the exclusive (craft) union model, a union increases wage rates by artificially restricting labour supply, through, say, long apprenticeships or occupational licensing.
- In the inclusive (industrial) union model, a union raises the wage rate by gaining control over a firm’s labour supply and threatening to withhold labour via a strike unless a negotiated wage is obtained.
- Bilateral monopoly occurs in a labour market where a monopsonist bargains with an inclusive, or industrial, union. Wage and employment outcomes are determined by collective bargaining in this situation.

THE MINIMUM-WAGE CONTROVERSY

MINIMUM WAGE The lowest wage employers may legally pay for an hour of work.

a a a o ral a ro al o r s a a **minimum wage** l sla o , s ro al o r s’ a o r os or rs. ro al a ra s ro $. 0 r o r o la a r ar sla o $ .00 r o r r s ol a. r os o a s o ro a l a ll allo l ss-s ll or rs o ar o or a r l r o s a o r y.

<info.load-otea.hrdc-drhc.gc.ca/~legweb/clc3/legislation/l3tocen.htm>
Canada’s Labour Code

Case Against the Minimum Wage

r s, r aso r s o r 1 - , o a a a o - l r - a (say, W) ll s ly s loy rs a r la o r a r s, a s o r r or rs. r la o r os s ay or so r s o o s ss. , so o oor, lo - a or rs o a as s o l ll s l so o or . r s o o a a or r o s *nem lo ed* a a a o $ .00 r o r s l arly ors o a *em lo ed* a a ar a ra o , say, $. 0 r o r. s o r s o a s a s oorly ar o r o r y. r s o o a o o a a r s o a or rs, os o o r o ly a s or s a y ars.

Case for the Minimum Wage

o a s o a say a r s a aly s a a r al s- o . r 1 - , a o a s la , ass s a o , s a ar . a or r al s , lo - ay la o r ar r r s so o o so y o r (r 1 -), a a r as a ra s o a s - loy . , a r a ay ro or o s y l - a o a o o so s r s a or r s r loy . or a l , a a oor o *Wc* r 1 - o l a r 's la o r s ly r o W_ca*S* a ro r o r as s loy ro Q_m or rs o Q_c or rs.

a ay r as la o r ro y, s la o r a r o r a o s a y r loy a a a s . or a l , r a ra ro r s o or ro as s or lo - a or rs, r y ra s r ro y. l r a- ly, a ay r *labo no e* (ra a or rs ol ar ly). r lo - ro ra s, *a e age* ro y o r 's or rs o l r s . r as , r la o r ro y o l s y ay r a . o, all a loy s o a o o r.

Evidence and Conclusions

s orr or a ly, r s o l ar a s r. ll o o s s a r r s so a so a o l s r ly r loy . o s r $20 a o r, as a a s r a l . o rr o s s s s s o loy s o r s l l o a . 1 0s s s a a s r loy o a or rs, ar larly a rs (1 - o 1 -y ar-ol s). o s s s as a a 10 r r as a o l r a loy y a o 1 o r . a a a s s s a a s 1 0s ro s all r, a r a s ro, loy l s a o a rs.

o rall o a s s r a . o a , loy a loy s o a o o a ar o a r a as a y r s ar. o r a , a s a lar ar o s s ss a o o o r y a l s, a s o as s ro a a - o r y ool as a y s or rs o .

s l ar, o r, a a as s ro ol al s or . r a s s s s ro o r al s (1) or or rs ar l y a a ar r a (2) a s so y so ass ra a loy- rs ar o a o a a a o l ra l , lo -s ll or rs.

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[4] Alan Krueger, “Teaching the Minimum Wage in Econ 101 in Light of the New Economics of the Minimum Wage,” *Journal of Economic Education* (forthcoming).

WAGE DIFFERENTIALS

o rly a ra s a a al salar s r r a ly a o o a o s. a l 1 - l s a ra ly a s ors ral s r s o ll s ra s o a o al **wage differentials**. or a l , o s r a o s r o or rs o a ra ar al os a r or a os or rs al a s r s ry. ar a r als also s so o o a o s l s (o s o). or a l , al o a ra a s or r a l sal s rso s ar r la ly lo , so o sal s rso s s ll o o ss o a s ral s a ra a s or ro a o . a la s a r als s as s a a , or so a a s ly ar r al . s o s ra r 1 - , a r als a ar s o r s ly or a s o la o r ar s. r s 1 - (a) a ( ) r r s la o r ar s or o o a o al ro s a a al *labo* *l c e*. la o r ar a l a as a r la ly l r a (W_a) a s la o r a s ry s ro . la o r ar a l as a l r a a s r la ly lo (W_b) s la o r a s a . l arly, a r al o a o s (a) a ( ) r s l s sol ly ro r s a o la o r a . o ras a s a o r 1 - ( ) a ( ), r *labo* *demand* *c* *e* ar al. la o r ar a l ( ), l r a s r la ly (W_c) a s la o r s ly s ly r s r . la o r ar a l ( ) la o r s ly s ly a a , so l r a (W_d) s r la ly lo . a r al ( ) a ( ) r s l s sol ly ro rs a o la o r s ly.

l o r 1 - ro s a oo s ar o or rs a a - r als, o o *h* a a s ly o o s r ar o s la o r ar s.

WAGE DIFFERENTIALS The difference between the wage received by one worker or group of workers and that received by another worker or group of workers.

MARGINAL REVENUE PRODUCTIVITY How much workers contribute to their employers' revenue.

TABLE 15-3 AVERAGE WEEKLY WAGES IN SELECTED INDUSTRIES, 2000

Industry	Average weekly earnings (including overtime)
All industries	**$ 626.45**
Mining, quarrying, and oil wells	1,152.60
Logging and forestry	821.23
Transportation, storage, communications, and other utilities	779.32
Manufacturing	778.30
Finance, insurance, and real estate	777.52
Construction	722.84
Educational and related services	672.88
Health and social services	542.25
Trade	476.48

So ce: a s s a a a, .s a a . a/ l s / . s . ra ll. a/ oll / o ll or a a a .

Marginal Revenue Productivity

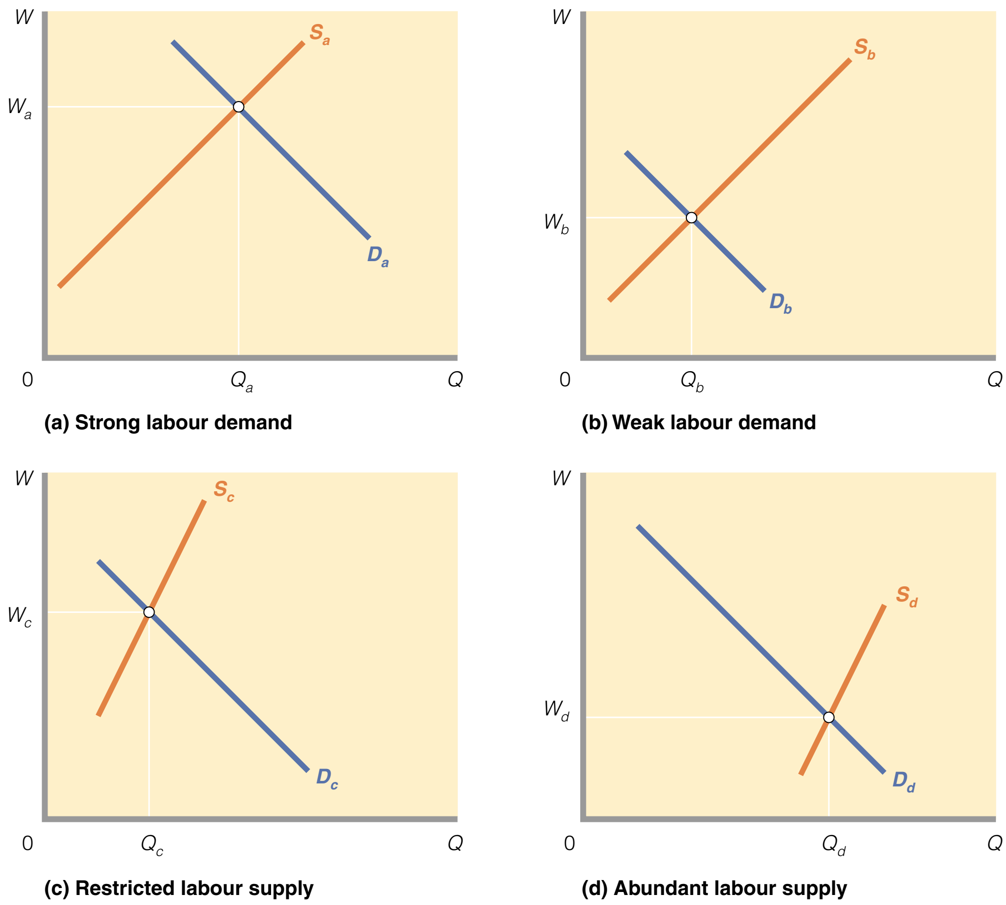
s r o la o r a o ar r ar la o r a r s lo a rs r a ly a o o a o s a s o r s o ar o s o a o al ro s o r o r loy rs' r . s r o r o , r , s o or rs' ro y a s r o a or ro s y ar l o ro . r la o r s ly ro - a ro a s s ro , la o r a also s s ro , a o r s al, ay s . o ro ss o al a l s, or a l , ar ly ro a s or s r a , or l- l o s o o l ar ll o ay ll o s o ollars o r o rs o a s aso . o **marginal revenue productivity** o s o lay rs s o ally , as ar r salar s, r r s r 1 - (a). o ras , os o a o s or rs ra or o s r or r loy rs, so r ay s lo r, as r 1 - ( ).

Noncompeting Groups

s ly s o la o r ar , or rs ar o o o o s y r r al

FIGURE 15-9 LABOUR DEMAND, LABOUR SUPPLY, AND WAGE DIFFERENTIALS

The wage differential between labour markets (a) and (b) results solely from differences in labour demand. In labour market (c) and (d), differences in labour supply cause the wage differential.



(a) Strong labour demand

(b) Weak labour demand

(c) Restricted labour supply

(d) Abundant labour supply

NON-COMPETING GROUPS Collections of workers in the economy who do not compete with each other for employment because the skill and training of the workers in one group are substantially different from those in other groups.

a ys al a a s a r a o a ra . a y la o r or s a o a y **noncompeting groups** o or rs, a r r-s s ral o a o s or rs o a ar lar ro al y. so ro s al or rs ar r la ly , r as o rs y ar ly a a . or rs o ro o o al y or o a o s o o r ro s.

ABILITY

ly a or rs a a l y or ys al a r s o ra s r o s, o-r ol s s, o as o o ls, r s ar s s s, or ro ss o al a l s. a s s ly o s ar lar y s o la o r s ry s all r la o o la o r a , r a s ar , as r 1 - ( ). rs o s a s lar ro s o o o o a o r or o r s ll or s s ll or rs. ol s o s o o s r o , or o s s r o o ol s or as o o l.

o o o o ro s a a l o ar o s s ro s a o s als a ar lar ro . s ally s ll ol s a o a a r salary a oll a s o lay sa s r . a l o o or ora s ar 10 o 20 s as as a ra - o r. a o s as s, s ly o o al s ly l , s l ss al oll a s ar o ly r s s s.

EDUCATION AND TRAINING

INVESTMENT IN HUMAN CAPITAL Any expenditure undertaken to improve the education, skills, health, or mobility of workers, with an expectation of greater productivity and thus a positive return on the investment.

o r so r o a r als as o o r a o so s a a al. **investment in human capital** s *an e endi e on ed ca ion o aining ha im o e he kill and, he efo e, he od c i i of o ke .* - r s o a ry a , r s o a o or ra a r as a or r's ro y a r ar as s s. o as s, r- r os s ar rr o a ll l a o a r a r *f e o o* ar s.

l o a o y l s r o s, arr s s s a al os s. oll or rs y a o ol s o o ly r os s (o , s, oo s) - r or o or y os s (or o ar s) as ll. o s r ay r y r- a or rs o sa or s os s a s r s y s. a s o r r ar s a o 10 o 1 r or s s s o ary a o a o 12 r or s s oll a rs y a o . r- ally a s a s a a y ar o s ool ra s s a or r's a y a o r . lso, ay a oll a rs y ra a s a - s ool ra a s r as s ar ly 1 0 a 2000.

Compensating Differences

COMPENSATING DIFFERENCES Differences in the wages received by workers in different jobs to compensate for nonmonetary differences in the jobs.

or rs a ar lar o o ro ar ally a a l o r or - s ral r o s, yo a ra s o al or all s o s. o so. ro o -s ool ra a s ay ally a a l o o sal s l r s or o s r o or rs, s o s ay r a s. r ally all lo al s, o s r o la o r rs r r a s a sal s l r s. s a r als ar all **compensating differences**, a s y s a o o sa or o o ary r s ar o s o s.

o s r o o ol s r y a s, a sor a , a ar o a s, a rr lar loy , o s aso ally a y l ally. r a l sal s o a s l a lo , l asa a r- o o s rro s, a l l ar o ry or lay- o . r s al, s asy o s y so or rs o l ra r a r ar a a s o l. o la o r s ly s or l or o s r o r s, as r 1 - ( ), a or r a l s o s, as r 1 - ( ). o s r o r s s ay r a s a r a l rs o o sa or a ra o o - ary as s o o s r o o s.

o sa r s lay a or a rol allo a so y's s ar la o r r so r s. ry or rs a o ar a oll ors, so y s ay a s o ar a oll ors o ar a oll . a y or o l a o sal s l r s, so y o ay as as ar a oll ors o os s r s r or .

Market Imperfections

as o ar al r ro y, o o ro s, a r s o o ary as s o o s la a y o a r als o - o y. o r rs s r als r s l ro s ral y s o ar r - o s a or rs ro l a r rr o s o a r- ay o s.

LACK OF JOB INFORMATION

or rs ay s ly a ar o o o or s a a ra s o r o ra ar as a o r o s or y al y. o s ly, o o al la o r ro lo r- ay o r- ay o s a s a s s la o r s ly ay o s o al a s o a o s.

GEOGRAPHIC IMMOBILITY

or rs a roo o ra ally. a y ar r l a o o o la s, o l a r s, r la s, a asso a s, o or r l r o a s ools, o s ll r o s s, or o r os s a o s o a s o a o a a o y. s a o or a o r s a o, r- so s o all sor s o l a os l o ra s or . r l a or a l y o or rs o o r a s o ra a r als sa o a o o rs s .

UNIONS AND GOVERNMENT RESTRAINTS

a r als ay r or y ar al r s r o s o o l y os y o s a o r . a o a ra o s o r a a a o r s r rs . r all, ar rs a r lay rs o oo l l, a s y a o a ll l . s, lo - a o o ar r o o o , l r a, ay ll o o o a o r rs o r a s, r a s or s ar sl . ay a l o a o ar , a o ar a s o o . larly, a o o r s or la y r al o ra - s o ro ay o l s r r s o o r ro s, so s a l y o o s l . r ar al arr rs ol s o la s a s or- y r s a o ar y o ro o o o a o r.

DISCRIMINATION

s l sla o o o rary, s r a o so s r s l s lo r a s a o o a s l - or y or rs a o al s o r- ally al or . lso, o a or s ay ro o r a lo - ay o a o s, r o a s r a ra s ls r . s r a o s al o a or s ro a r- ay o s, r s ay ll rs s .

ll o r o s ra o s r s ar al r ro y, o o - ro s, o o ary r s, a ar r o s o o lay la a al a r als. or a l , r al a s o a ys a a os o a o s r o or r a la as o ar al r ro y a o o ro s. ys a s ra o s ra l r a s o r ro y a s ro ll ss o o s rs (a ro al o r s) o ay or al ar . ys a s also all o a o o ro r , a s o s r ra r r s, o ly a r la ly rso s al y. o s ly o la o r s s all r la o o a .

so o s r o or , r ra r r s ar l ss s - a , s ly o la o r s r a r la o a , so, a s ar lo r or o s r o or rs a or ys a s. o r, o or l asa ss o o s r o or r's o a a a ra o o s r s r s r rs ol s, r al o l r a r a s.

PAY FOR PERFORMANCE

o ls o a r a o a s r s a r ass a or r ay s al ays a s a ar a o or a o r's or , or a l , $1 r o r. ay s s ar o or o l a a o o os o a r os . or s a , a y or rs r a al salar s ra r a o rly ay. a y or rs also r r s al s ra , l s ra , a a a o s, a s -l a ays, s o o r o s, a so o . ally, so ay la s ar s o l a s r l l o r or a ro or rs. s las as o ay la s r r s r r la ora o .

The Principal–Agent Problem Revisited

a r rs *inci al agen oblem* as r la s o oss l - r s r s s o or ora s o ol rs (r als) a s (a s) y r . s ro l s o all or rs. r s r or rs a s y ar o l ro oo s a s r s r s s ll or a ro . or rs ar r s' a s y ar r o a a r s (ro) o r s. r als ar r s y r a s o a a r oals. r s a or rs a o r s o o y o a r o s r a r . a ll s r ro or r a o loy a a s or or rs.

r s s o r a o or rs ar o al. r al a ro l ar s s os r s s r . or rs ay s o r as r l y y s r o o , a s, y ro l ss a a r -o or or y a a or r a s. y ay ro r ll- y r as r l s r , r a or o rs, o or o . s r y ar a ar o s ay l a or arly or s r a a o l ra r a a ass ro s. salar a a r ay s a ay ro o s r s ra r a a o o a y s ss. r s (r als) a a ro o r or l a s r . o o s o o or or rs, o or s l a os ly. r a o r or r o s r s or o or s r y ar o l os o a - a a s r ar o s . o r ay o r sol r al a ro l s ro so sor o **incentive pay plan** a s or r o sa o or los ly o o or r or a . ay s s l ra s, o ss o s a royal s, o s s a ro s ar , a y a s.

INCENTIVE PAY PLAN A compensation structure that ties worker pay directly to performance such as piece rates, bonuses, stock options, commissions, and profit sharing.

PIECE RATES

ra s o s s o o sa o a a or o r o s o o a or r ro s. a r al ays r rs y s l or y s s y a , o o r s r or o or os s.

COMMISSIONS OR ROYALTIES

l ra s, o ss o s a royal s o sa o o al o sal s. loy s o s ll ro s or s r s l r al s a a s, s ra a s, s o ro rs, a r a l sal s rso s o o ly r *commi ion* a ar o as a r a o o ary al o r sal s. or ar s s a a ors ar a *o al ie* , o as a r a r a o sal s r s ro r or s. y s o o sa o l a al r s s o sal s o l or ar s s a a ors o ro r s o r s.

BONUSES, STOCK OPTIONS, AND PROFIT SHARING

Bon e ar ay s a o oo 's a al salary a ar as o so a-or s as r or a o al or r, or o a ro o or rs, or o r s l. ro ss o al as all lay r ay r a o s as o a a-a ra , r o o r s , or r o r s a . s-ss a a r ay r a o s as o ro a l y o r or s . *S ock o ion* allo or rs o y s ar s o r loy r's s o a a , lo r r s o r r s s. o o s ar ar o o sa o a a s o o or ora o als, as ll as a y or rs r la ly olo y r s. *P o - ha ing lan* allo a a r a o a r 's ro o s loy s. la s a r y ars r s l lar a al ay s o a y a a a or rs.

EFFICIENCY WAGES

ra o al *ef cienc age* s a loy rs ll oy r a r or ro r or rs y ay a o - l r a ra s. Gla a a r 1 - , s o s a o la o r ar l r a ra s $10. a a loy r s o ay a a o - l r a o $12 r o r a r a r a a os sa a a o ar r al r s ay o ly $10, r a ro or r or a ro y so a la o r os s a ally all. or a l , a or r ro s 10 s o o r o r a $12 a ra o ar o ly s a $10 a ra , la o r os s or - a r ll o ly $1.20 ($12 10) o-ar o $1. ($10) or r s ay l r a . a o - l r a ay a or r y s ral ays. a l s r o a ra r- al y or rs, l s or r oral , a lo-rs r o r, r s l a or r or or , r a r or r ro -y, a lo r r r a ra os s. a s o or y os o los a r- a o s r a r, or rs ar or l ly o or r s or s l ss s r s o a o or . a , y a ay s a ro or a y loy rs.

Addenda: The Negative Side Effects of Pay for Performance

l o ay or r or a ay l o o r o r al a ro l a a or r ro y, s la s ay a a s s a so r r ar l s . r ar a a l s

- ra ro o a a ra s o ra ay r s l oor ro-al y a ay o ro s sa y o or rs. o o s a os ly o r o r lo r .
- o ss o s ay a s so sal s o l o a s o a l or ra l sal s ra s, s as a a ra la s a o ro s or r o r a rs. ra s ay l a o r a la-s s or o r l al a o .
- o s s as o rso al r or a ay sr los oo ra o or a a ro o . ro ss o al as all lay r o r s a o s or o s s or ay r l a o ass all o a a s.
- ro s ar s s ally o r or a o r r , l ss r or rs a r -r y o a r ro s ar as o ar or o o rs.

- r ay a o s o r ro orrs l ro a o - ar a s r s a ay y a s a r o or s o r or rs a s r loss o loo a so s r s or la .

QUICK REVIEW

- Proponents of the minimum wage argue that it is needed to assist the working poor and to counter monopsony where it might exist; critics say that it is poorly targeted to reduce poverty and that it reduces employment.
- Wage differentials are generally attributable to the forces of supply and demand, influenced by differences in workers' marginal revenue productivity, workers' education and skills, and nonmonetary differences in jobs. Several labour market imperfections also play a role.
- As it applies to labour, the principal–agent problem is one of workers pursuing their own interests to the detriment of the employer's profit objective.
- Pay-for-performance plans (piece rates, commissions, royalties, bonuses, profit sharing, and efficiency wages) are designed to improve worker productivity by overcoming the principal–agent problem.

LABOUR MARKET DISCRIMINATION

<is.dal.ca/~eequity/INFO/question.htm> Frequently asked employment equity questions

roa ly , la o r ar s r a o o rs al la o r r so r s ar a or r a r ly o r ro o r o s ar al. s r s r s l ro a o a o o o s r a ory a s r a ory a ors. or a l , s s a a a o o - al r- s ar s a o a sa s l or- s a la y s o s r a ory a ors as r s a o , a , ra , s ry a o a o , o rs , lo a o , or r- , o y o or , a al . (o rs , so o s a ors ay - y s r a o .) o r al s a la r , l o o o ssa r o s r a o

la o r ar s r a o , r a ro so o l ar o a or - r or r a r s o r , o a o al a ss, a o a ra , ro o o , a ra s, or or o o s o y a sa a l- s, a o a ra , a r as or r rr ro s. o l o ra s s r a o ar sa o a r or as a a s ar s o r s r a o .

Types of Discrimination

a o r ar s r a o ay a s ral or s

WAGE DISCRIMINATION The payment of a lower wage to members of a less-preferred group than to members of a more-preferred group for the same work.

- **age discrimination** o rs o or rs o or s ar a l ss a al s or o sa or . s o s r a o s l a s o s l ss a a a l arly ola s ral la . a s r a o a s l a l o . or a - l , o a or s so s a r o lass a o s arry lo r ay a o lass a o s l y al s, o y ar r or ss ally sa as s.

EMPLOYMENT DISCRIMINATION Inferior treatment in hiring, promotion, and work assignment for a particular group of employees.

OCCUPATIONAL DISCRIMINATION Arbitrary restriction of particular groups from more desirable, higher-paying occupations.

HUMAN CAPITAL DISCRIMINATION Arbitrary restriction of particular groups from productivity-enhancing investments in education and training.

- **Employment discrimination** a s la o or s l- or y or rs r r or r a r , ro o o s, ass s, - orary layo s, a r a s ar s. s y o s r a o also o ass s s al a ra al arass a r a or la y o or rs or a s ra ors.
- **Occupational discrimination** o rs o or s l- or y or - rs ar ar rar ly r s r or ro ro r or s ra l , r- ay o a o s. s ss o a o l o r a ro lass l a r s ro o o ra s. s l or s a sal s os o s ar r la ly rar . a o , s ll a o or s as l r al or , r lay , a l o o a s l or y r r s a o .
- **uman capital discrimination** o rs o or rs o or s o o a sa a ss o ro y- a s s a o a ra as al s. or a l , lo r a ra a o al a a - o s l or s as r r o or s la o r ar .

Costs of Discrimination

s r a o os s os s o os o ar s r a a a s . ro s a s r a oo o s a r ay a ar l ro ar- s o s r a o . s r a o o s or a s ly ra s r s ro o a s l or s o a s r s s, s r a- o a ally s s o o y's o a o l a y o r ar al arr r o r o o , r as s o o y a r s ro o . y ar rar ly lo r a al ro s o o l ro - ro y (a s - a) o s, s r a o r s ro a r a - o r o o so y's o , o , a ll- .

so s r a o a as a o s o o y's ro- o oss l s r , s as o *D* r 1 -10. s a o , o - o y o a s so o a o o a al a o s o oo s r , K_d + C_d a s l ss s ra l a o a o s r r s y o s s as *X, Y,* or *Z* o r . y r o o y ro a ro y, s- r a o r s a o 's r al o a o . ry ro s a ss s a a a a o o y o l a $ 2 ll o r y ar y l a ra al a s r a o a so $1 ll o r y ar y r s r a o .

ECONOMIC ANALYSIS OF DISCRIMINATION

r r s o l , l a , a ly ra l s a a - s. s, o o s a o r so s o s r a o o a l la a o s. s a o , l 's loo or ly o o- o so s r a o .

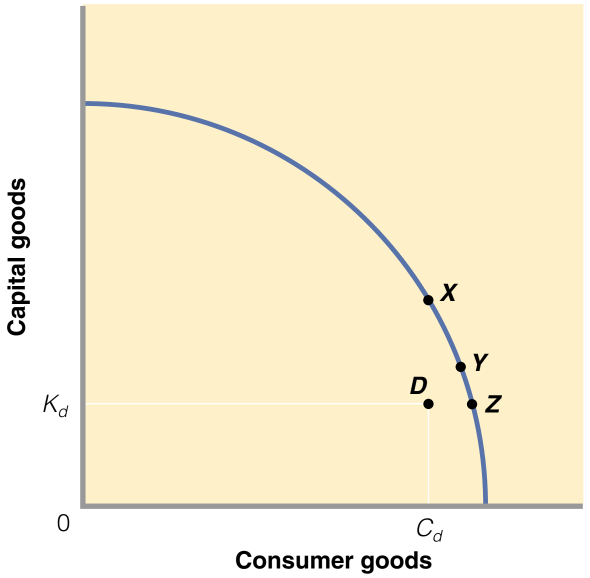
TASTE-FOR-DISCRIMINATION MODEL A theory of discrimination that views it as a preference for which an employer is willing to pay.

Taste-for-Discrimination Model

taste-for-discrimination model a s r y s o o - r la a o a ory. s s r a o as r s l ro a r r or as or s r a or s ll o ay. o l ass s a , or a r r aso , r o l r a s or sy os a

FIGURE 15-10 DISCRIMINATION AND PRODUCTION POSSIBILITIES

Discrimination represents a failure to achieve productive efficiency. The cost of discrimination to society is the sacrificed output associated with a point such as *D* inside the nation's production possibilities curve, compared with points such as *X*, *Y*, and *Z* on the curve.



s l y r y s ra os y ar as a a s . o s - ly, y ar ll o ay a r a r o a o ra o s o - r rr ro . s o s r s r ly o r o r . as - or- s r a o o l s ral s a a l o ra , - r, a , a r l o , o r s ss o o s s o loy r s r a o , loy rs s r a a a s o r rr or rs. or o r ss, ll loo a a loy r s r a a a s s l - or y or rs.

DISCRIMINATION COEFFICIENT

DISCRIMINATION COEFFICIENT A measure of the cost or disutility of prejudice.

r loy r a s as loy s l - or y or rs o l a a os . a o o s os s s l y s r a **discrimination coefficient**, *d*, as r o ary s. a s loy r s o r a a s s, os o loy a or r s a ra , *W* . o r, loy r's r os o loy a s l - or y or r s s l - or y or r's a ra , W_b, *l* os *d* ol loy r's r , or $W_b + d$.

r loy r ll a o r r s l - or y a or rs o al os r or r s sa , a s, *W* $W_b + d$. os ar a ra or s s $10 a o ary al o s l y loy r a a s o r s l or s s $2 (a s, *d* $2). s loy r ll r r s l or s a s o ly s l - or y a ra s $, s a s a r os o r r a or a s l - or y or r s $10 $10 a $ s l - or y a + $2 s r a o o .

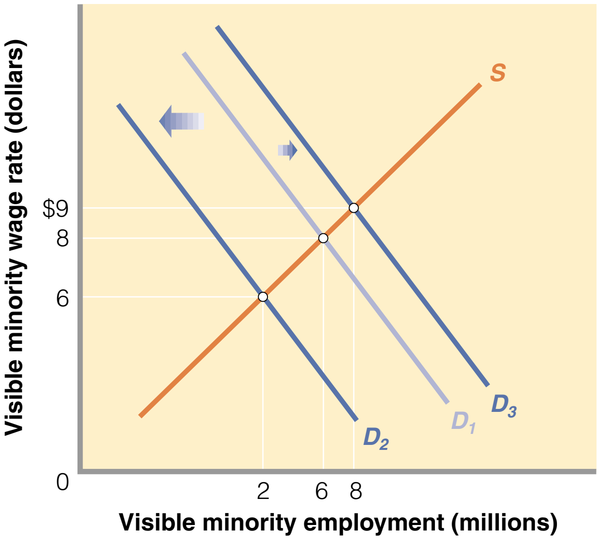
I follo ha o ej diced hi e em lo e ill hi e i ible mino i ie onl if hei age a e i f cien l belo ha of hi e . y s ly a a l as a o o s r a o o .

r a r a loy r's as or s r a o as r al
o *d,* lar r r a s a lo r a s a
s l or s ll r . olo r- l loy r os *d* s $0 ll r
ally ro s l or s a s ar ally r a s ar
sa . la a ly r loy r os *d* s y o l r s o r
s l or s s l or y a r ro.
os r loy rs ll o r s o r s l or s r
all o o s. y ll, a , *efe* o r s l or s a al
s l or y a r ar s al o *d.* o r a -
l , s a r a $10 a ally ro s l or s a o ly
$. 0, as loy r ll r s l or s. a loy r s ll-
o ay a a r o o $2 r o r or s o sa s y s or r as,
o or . $2. 0 a al r , loy r ll r s l or s.
o rs ly, s a r a $10 a s l or s a $. 0, s
ll r . a , as loy r s ll o ay a a r o
o $2 or s a $1. 0 a al r a s a r s s a ar a or
s loy r.

PREJUDICE AND THE MARKET VISIBLE MINORITY–WHITE WAGE RATIO

or a ar lar s ly o s l - or y or rs, a al s l or y
a ra o ra o r la o r ar ll o
oll r o loy rs. o s y, o s r r 1 -11,
s o s a la o r ar or *i ible-mino i* or rs. ally, s os r l a
la o r a r s D_1, so l r s l - or y a s $ a
l r l l o s l - or y loy s 1 ll o . ass a
hi e a (o s o) s $10, al s l or y a ra o
s . 0 ($ /$10).

FIGURE 15-11



An increase in prejudice by white employers as reflected in higher discrimination coefficients would decrease the demand for visible-minority workers, here from D_1 to D_2, and reduce the visible-minority wage rate and level of visible-minority employment. This drop in the visible-minority wage rate would lower the visible minority–white wage ratio (not shown). In contrast, if prejudice were reduced such that the discrimination coefficients of employers declined, the demand for visible-minority labour would increase, as from D_1 to D_3, boosting the visible-minority wage rate and level of employment. The higher visible-minority wage rate would increase the visible minority–white wage ratio.

o ass a r a a s s l - or y or rs r as s a s, oll *d* o loy rs r s s. r as *d* a s a r as r os o s l - or y la o r a a s l - or y a ra , a a r s a or s l - or y la o r, say, ro D_1 o D_2. s l - or y a ra alls ro $ o $ ar , a l l o s l - or y loy l s ro s ll o o o ll o . r as loy r r r s s l - or y a ra a s a al s- l or y a ra o. a ra r a s a $10, s- l or y ra o s . ($ /$10).

o rs ly, s os so al a s a s a loy rs o l ss as a r s r a o o as a ro l s. s a r as s r os o s l - or y la o r a a s l - or y a ra , so a or s l - or y la o r r as s, as ro D_1 o D . s as , s l - or y a ra r s s o $, a loy o s l - or y or rs r as s o ll o . r as loy r r - r as s s l - or y a ra a s a al s l or y a ra o. a r a s a $10, s l or y a ra o s . ($ /$10).

COMPETITION AND DISCRIMINATION

as - or- s r a o o l s s s a o o ll r s r - a o ry lo r , as ollo s a al s l or y a - r or ally ro or rs say, $2 allo s o s r a ors o r s l or s or l ss a s. r s a r s l - or y or rs ll, r or , a lo r a al a os s r o o a lo r a ra o al os s a ll r s a s r a . s lo r os s ll allo o - s r a ors o r r s r a o ors, ally r o o ar .

r so s l a o o as - or- s r a o o l o a ro r ss l a ra al s r a o as o s . s r a o as o ra as rs s a a a a o r ar o o s a a r a . o la y, o o s s a ro os o r o ls. (*Key Question 12*)

Statistical Discrimination

STATISTICAL DISCRIMINATION Judging individuals on the average characteristic of the group to which they belong rather than on their own personal characteristics.

s o ory o s r a o r s o o o **statistical discrimination,** *eo le a e j dged ba ed on he a e age cha ac e i ic of he g o o hich he belong, a he han on hei o n e onal cha ac e i ic o od c i i .* - ss o s ory s s s s o a s r a ory o o s ar oss l r o r s s.

BASIC IDEA

os yo ar a o l , sol a l , a a al ro l a ol yo ll $1 ll o as yo a y a s o a s o s a a l o sol . a s a yo a o ly 1 s, ar r s r o a - s ar a, a s a roa s s o a a . o a o o sa s o s s all s ra rs o l yo a roa rs o sly, yo o l r r o oos a a a s, ys s, or r a or. o l yo oos a a or a o a or a r o a s l or y r or ra lays a y rol yo r o , yo ar a s a s al s r a o .

LABOUR MARKET EXAMPLE

o o ss a s al s r a o s o s l la o r ar s loy rs o o s a o r os ro or rs a a la l . y a r rso l ar oll or a o o r a o a l a , l a , a o , a or r . y ay s l a or a o r loy s s, y l ar l l a ors o o al o r- or a . s ry s o oll a l or a o a o o a l a s, a s l o r o r or a as o l a a. o s ly, so loy rs loo or s or a o a y o s r *a e age* ara r s s o o a or s r o o r . y ar ra s s a s al s r a o y o so. y ar s r, ra , or a ro as a r a or o ro o -r la a r s. or a l , s os a loy r o la s o s a ly ra a or r o s a o a ra o ar l ss l ly o ar r-or a , or l ly o or o ar or yo l r , a or l ly o r s o- ra al ra s rs. s, o a ra , r r o loy r's s ra s l ly o l ss oos a o a a oos a a . ll ls al, oos o o a l a s, o a o a a o r a a , s loy r s l ly o r a .

o a s a r . ra ara r s s or a *g o* ar a l o *indi id al* rs o a ro . loy r s als ly ass a *each and e e* o a or r as sa loy s as *a e age* o a . s r o y a s a ro s o o ar ar r-or , o la o or a r a l r , or o o ' la o a l r , a o ar l as o o ra al ra s rs ll s r a a a s .

PROFITABLE, UNDESIRABLE, BUT NOT MALICIOUS

r a ra s s s a s al s r a o s o al o s s r a o r (al o ay ola a s r a o la s). s o s a s ll ra o al a ro a l , a s *on a e age* s r s o s ar l ly o orr . r l ss, a y o l s r a s o s a s al s r - a o , s lo s o o r o a a l o l . s ro - a l , s a s al s r a o s o rs s .

Occupational Segregation: The Crowding Model

OCCUPATIONAL SEGREGATION The crowding of women or minorities into less desirable, lower-paying occupations.

ra o **occupational segregation** *he c o ding of omen, i ible mino i ie , and ce ain e hnic g o in o le de i able, lo e - a ing occ a ion i ill a a en in he Canadian econom* . a s s a a o ar s ro or o a ly o - ra a l r o o a o s s as a , rs , a s r ar al a l r al o s. s l or s ar ro o lo - ay o s s as os o la ry or rs, l a rs a o s ol a s, os al or rl s, a r l ral or rs, a o r a al la o r rs.

's loo a a o l o o a o al s r a o , s o a as a a l .

THE MODEL

ara r a o o s s o o a o al s r a o ar r al ro a la o r s ly a a o l. a ollo ass o s

- la o r or s ally al a al or rs. 's say r ar s ll o al a s ll o al or rs.

- o o y o r s s r o a o s, , , a , al la o r a r s, as s o r 1 -12.
- a o a sa la o r or ara r s s a o r o a o s o l ll ally ll y or y o .

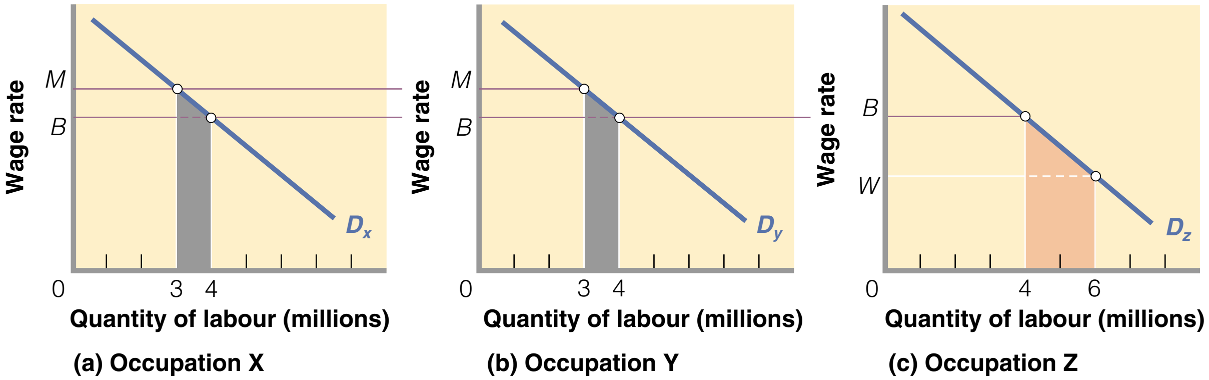
EFFECTS OF CROWDING

os a , as a o s o s r a o , s ll o o ar l ro o a o s a a ro o o a o , r y ar a *W*. s r s l s ally a o o a o s a , a a r ll o al or rs ar a o a o a a a o o a o *M*. (ass a r ar o arr rs o o l y a , a y ally r s r o o al s a o l r s l a a r al o o a o s. a r al o l ro la o r s s ro lo - a o - a o a o l a al s r o o rr .)

a s o ar ro o o a o , la o r s ly (o s o) s lar r a r a ra *W* s lo r a *M*. a s o s r a o , s s a l r s a o a ll rs s as lo as ro o rs. o a o al arr r a s o a o o o o a o s a r- s o a r a .

r s l s a loss o o or so y. o s y, r all a a a la o r a r s la o r's ar al r ro , s la o r's o r o o o s o . s, r y ar as or o a o s a r 1 -12 s o r as o s o ar al o ar al o a s y s ra o ll o o ro a o s o a o s. larly, ora ar a or o a o s o s r as o s o a s y o o ll o o o o a o . l o so y o l a a o r r s y ora ar a o a o , o l los o - r r s y s o o r y ar as o a o s a . a o - loss s o a , ro a o loss or so y.

FIGURE 15-12



(a) Occupation X (b) Occupation Y (c) Occupation Z

By crowding women into one occupation, men enjoy high wage rates of *M* in occupations X and Y, while women receive low wages of *W* in occupation Z. The elimination of discrimination will equalize wage rates at *B* and result in a net increase in the nation's output.

ELIMINATING OCCUPATIONAL SEGREGATION

o ass a ro l sla o or s a s so al a s, s-
r a o sa ars. o , a ra y r a ra s, s ro o a-
o o a o ll o o o o a a o r o ll o o
o . o r ar o r ll o or rs a o a o al s r a o s
l a . a o r ar o r ll o or rs a o a o , a
a ra s all r o a o s ar al, r a *B*. a a al y l -
a s or r r r allo a o s o la o r.

, o s r a ory l r l arly s o , o o
r r a s r s , o o r lo r a s. o r
ally ar a ro s r a o r o s r a-
o orr s a s a o .

o y also a s. l a o o o a o al s r a o r rs s
o loss s s ss . o ll o o o a o o a o s a
r 1 -12 r as s o s o y s o o r y ar as.

r as o s o a s y los o ll o o ro o a o
s s o y ora ar a. s o o r as s o s o
a s r as o s o . o s r a-
o , o ll o o or rs a o ro o a o , r r o -
r o o o s o (r) s lo , o r ay o a o s a
, r r o r o o o s o s . s so y a s a or
allo a o o r so r s ro r o al o o a o al s r a o . (
r s o r 1 -10, so y o s ro a o s s ro o oss l s
r o a o los r o, or o , r .)

or a l , s os as o o a o al arr rs as l o a s r o
o a a a r s so - ay ro ss o s. r y ars, or
s a , r a o la r s a al r s a ar o o as
0 r , o ar l ss a 10 r 1 0. (***Key Question 14***)

QUICK REVIEW

- Discrimination reduces domestic output and occurs when workers who have the same abilities, education, training, and experience as other workers receive inferior treatment with respect to hiring, occupational access, promotion, or wages.
- Nondiscriminatory factors explain about one-half of the gender and racial earnings gap; most of the remaining gap is thought to reflect discrimination.
- The taste-for-discrimination model sees discrimination as representing a preference or taste for which the discriminator is willing to pay.
- The theory of statistical discrimination says that employers often wrongly judge individuals based on average group characteristics rather than on personal characteristics, thus harming those discriminated against.
- The crowding model of discrimination suggests that when women and minorities are systematically excluded from high-paying occupations and crowded into low-paying ones, their wages and society's domestic output are reduced.

ANTIDISCRIMINATION POLICIES AND ISSUES

KEY CONCEPTS
The Role of Governments

o r as s ral ays o al s r a o . r ol-
y s o ro o a s ro , ro o o y. a a or ro s

r as s a or all or rs. o o y s a or ar ll loy- , r loy rs s ay r as ly r a s o r rr or rs a ay ro o r loy rs. a y, r a s os , s loy rs ar l ly o a r as or s r a o s o or os . la o r ar s also l o r o s r o y . o a or s o a oo o s la o r ar s, y a a o or y os o a y a o or as ll as al s.

s o r a s r a o ol y s o ro a o a ra - o or s o o a or s. or a l , ra a y a al y o s ool r y s l or s ll a or o - s or r- ay os o s.

r ay o r s r a o s ro r o r al r- o . ral a ro al o r s a o la r a ra s r , ro o o , a o sa o a a r r a o r o ra - ors a a o o s r a o a or s ar r a l as o r ro or o s o la o r or .

The Employment Equity Controversy

EMPLOYMENT EQUITY Policies and programs that establish targets of increased employment and promotion for women and minorities.

Employment equity o s s s o s al or s y loy rs o r as loy- a ro o o o or s or ro s a a s r as s r a- o a a o o r s r a o . o say a loy y as s rr o ro rsy s o a a rs a . ro ar s ar a or a a a s s a roa o r y s r a o .

IN SUPPORT OF EMPLOYMENT EQUITY

os o s or loy y say a s or ally o a or s a or o arry ra r o s r a o r a s o a o o s ss. s, y s l s ar al s, o a r rr or rs. r ly r o s r a o r o s o o los r s so o o o a . r ss a o o r o a or s, o s o ro al o or y, s ssary o o r r as a o r o o a or s ar o a . or rs o loy y ar a o s r a o s so r as a ll rs s or a s so y s o o a o ly ar al a - s r a ory a s loy ra s. or o r, s a s ar a - r y a a al s a a o - - o s or y, ro s ro layo s a la s r o loy s ro or o - a ly o o a or s. o a or s a s r - a a a s a r a a al a o a o ra o o o al r s al s. s r a o as s os ly o so ly s o al a raor ary o r as r s ar r r .

os o a s l o r aso ors loy y a r - r al r a as a ro r a a s or as l a o o s r a- o . s , loy y s o o ly a a o ar so al y also a oo a o al s ra y or a y a o o ro s r s or rly l ro s r ly o ro o o a s r a .

<www.web.net/~allforee/empeqity.htm> Employment equity: Facts and myths

OPPOSING VIEW

os o o os loy y la a o o s yo a r ss r r o o r r al r a . s , loy y as

REVERSE DISCRIMINATION The view that the preferential treatment associated with employment equity constitutes discrimination against other groups.

o ro loy rs o r l ss- al o a l ss- al s l-or y or rs, a r o o y. y also s s a r r al r a s s ly **reverse discrimination**. r r al r a a s r a-o , y say, ar s ly o s o sa o s o r r or s o s r a a a s .

o o o s o loy y o r r, o a ol s a r r al r a o sa a a ro s a a ally or o lo - r r o os ro s. ol s, y say, a la a y r-so s os o s r r r la s ll s o o r loy rs a o or rs. a as a o s, o a rs , a or y or rs o a ass o r or o s or ro o o s r s os o ar s al r a . o , o rs ay s a ly s r o y ly al-o a s l - or y rs o or or o a o o r r al r a as loy y r s. s ly o ro rs al , o ra al s o o o ly r s lo l a y o s r a o also s ral ll- o loy y ol s s o .

IMMIGRATION

ra o as lo o ro rs al a a a, a s o s ar o o s r a o . o l or or r o l allo o ra o a a a o s o l ro l o ll al ra s a l

Number of Immigrants

LEGAL IMMIGRANTS People who lawfully enter a country and live there.

a al o o **legal immigrants** (o a r ss o o r s a a a) as ro ly 1 0,000 ro 1 0s o 1 0s. 1 0s, r o - ra s a ra or a 200,000 r y ar. o o - r o r a al o - la o ro a a a s r s l o ra o . (Glo al rs 1 .2 s o s o r s o or o a a a's l al ra s 1 .)

ILLEGAL IMMIGRANTS People who enter a country unlawfully and live there.

a a ar r , o r, a s y o o l **illegal immigrants**, os o arr o r ss o .

Economics of Immigration

r 1 -1 ro s so s o o o s o ra o . - r 1 -1 (a), *D* s a or la o r a a a r 1 -1 ( ), D_m s a or la o r o. a or la o r s r a r a a a, r - s a ly a s a o as or a al a or a a olo s a a ro y o la o r. (all ro a r 1 a la o r a r s as o ar al r ro y o la o r.) o rs ly, s a ry a ar r s a ly s ar o a olo y l ss so s a , la o r a r s a . also ass a or - ra o la o r or s o a a a a o ar c a C, r s ly, a a o o r s ar a ll loy .

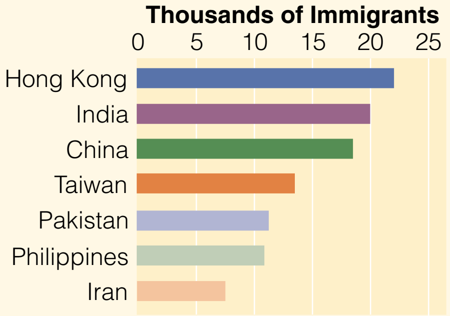
WAGE RATES AND WORLD OUTPUT

r r ass a ra o (1) as o os , (2) o rs sol ly r s o s o a r als, a ( ) s y la r o ry, or rs ll ra ro o o a a a l a ra s o o r s ar al a W_e. a l l, *CF* (als *cf*) or rs ll a ra ro o o

GLOBAL PERSPECTIVE 15.2

Canada's immigrants by country of origin

Almost half the 216,000 legal immigrants who came to Canada in 1997 originated in the 7 countries shown here.



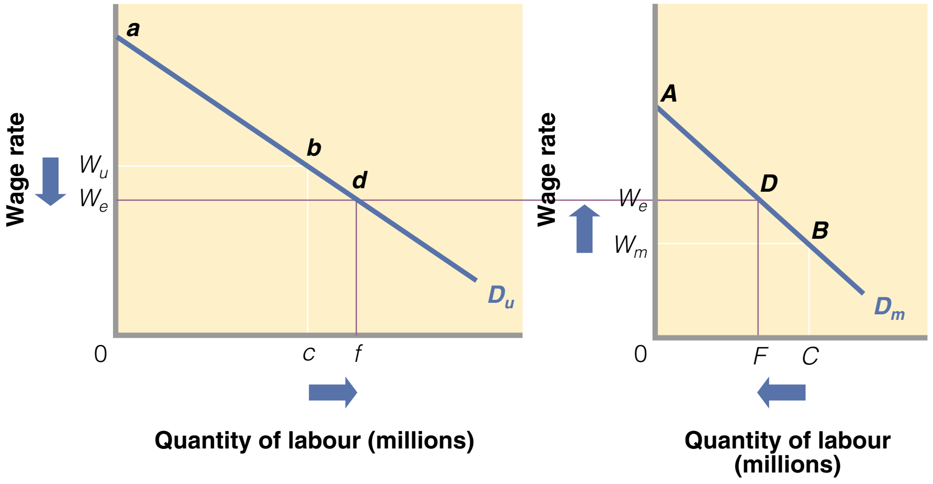
Source: Citizenship and Immigration Canada, <www.cic.gc.ca/English/pub/facts97e/1g.html>

a a a. l o a a a a l l ll all ro W o W_e, o s o- (s o ar al r ro s o r or or) ll r as ro 0*abc* o 0*adf*. o, a ra ll r s ro W_m o W_e, o s o- ll l r ro 0*ABC* o 0*ADF*. a s a o s o *cbdf* a a a s o loss *FDBC* o, orl 's o as r as .

a o l a l a o o arr rs o r a o al o o la o r s o r as orl o o y. orl a s a s r o o ra a l s o l o o o o r s r y a a lar r o r o s o orl ro o . ra o ol s a y a . a l s orl o ro a lar r r al o a a o o r so r s.

FIGURE 15-13

The migration of labour to high-income Canada (panel a) from low-income Mexico (panel b) increases Canadian domestic output, reduces the average level of Canadian wages, and increases Canadian business income while having the opposite effects in Mexico. The Canadian domestic output gain of *cbdf* exceeds Mexico's domestic output loss of *FDBC*; thus the migration yields a net increase in world output.



(a) Canada

(b) Mexico

INCOME SHARES

r o l also s s s a o o ra s ll a s ss o (or a al s o) a a a a r o. s s o , or - - ra o o s o a a a s r r s y ar a 0*abc*. o al a ll s 0*W bc* a ra l l y r o or rs. r a r - a lar ar a *W ab* r r s s s ss o or ra o . sa r a- so a l s o o, r W_mAB s or - ra o s ss o . ra o r as s s ss o ro *W ab* o W_ead a a a a r s ro W_mAB o W_eAD o. a a a s ss s ro ra o a s ss s ar r y ra o . s r s l s a o l ly a a a s a a la o r, a o s los a la o r. s o l s o s o s s s or al a a a a a loy rs a o a ly r r ra s.

Complications and Modifications

r o l l s so s l y ass o s a o rloo s a r l a a or. o r la so o ass o s a ro o a or o s o o r o l s o s ar a .

COSTS OF MIGRATION

ass a r a o al o o or rs s o rso al os , o o sly s o . o l , o -o - o os s o ys ally o or rs a r oss ss o s a l o or y os o los o l or rs ar o a o s a l s o ry s . ll or s l os s ar ol a a o a l r , la a , l a , a so or . ll s os s s s a y o al ra s a a a s s o r a s o ry. o l o s a a s os s ll ra o l o s os s as s ll s ay . r s o r 1 -1 , s o ra o os s a s a o o la o r ro o o a a a ll s o s or o a o los a - r al r ly. a s ll r a so a r a a a a o a r ll o a s r r ra o a los a a a s ar al o r a o s o o r ar al os o ra- o . s, orl ro o a ro ra o ll r s a s ll o al .

REMITTANCES AND BACKFLOWS

os ra o s r a or rs o a r s lls r o ry o o r r o . o r, so ra s r o s as orary. y o o a or ly lo o ry, a la so al or - a o ro ar or a r al y, a r r o o s a l s r o r r s s. r r o ry, ra s r ly a s a l r a s o r a l s a o , a s a r s r o o a ro ra o o r s ol . r 1 -1 , r a s y a or rs a a a o r r la s o o l a s a a a a o s o o l ss a s o a loss o a o s o also o l ss a s o . al a o s r r o ra s o r o o ry also al r a s a loss s ro . or a l , so a or rs o ra o a a a a r s s a al la o r ar or a a r al s lls a

r r o , r a a a al a as sa al o-
r o o oo lo o.

FULL EMPLOYMENT VERSUS UNEMPLOYMENT

r o lass s ll loy s a r o r s. -
a or rs r s a ly l a lo - ay o s o a (or or l ss a ly)
r- ay o s a a a. o r, a y as s a or a s s
ra s ro r o la s s o lo a s ro loy a
r loy . a y lo o r s ar o r o la a a s r-
l s la o r or rs ar r loy or so rossly r loy a r
ar al r ro s ro.
allo or s oss l y, o a ally a s (o los s) y a
s or rs ra . loy or rs ar a o o r o o
o's o s o a s s s a y ra s rs ro r s o
la o r or . r a a la o r or ll r o y a o
o ra s rs a r loy or rs a ra o a a a. o -
rs ly, a ra or rs ar a l o o s a a a a ar
s s a ro ra s rs ro loy a a a or rs, a r- a
o o or a a a s ll l . (*Key Question 17*)

Immigration: Two Views

ra o al r o o ra o s a o s s s o yo , a o s
or rs s o or y a a a. y ar s or s ss a s o
o ra a r a o y l a r l ral roo s o ro
r l s. s r or rs r as s ly o oo s a s r s
r la o r a s l a o sly r as a or oo s a s r s
r o s a s . s or , ra o s a o o o ro r ss.
o r s a ra o s a so o o o ra o r
o ry. ra s o o s or rs or s ar o s, ll o
a ra l l o r al a s, a r a a a l ar sys .
o s s ar ar oo s l s . ra o a r or ar
r a o , o r o ra s r a o , s lls,
a or a ra a y a a sor o o o y -
o sr o . ro a s r ly o o rs , a o s s o a
s ro ra o s o l a ra o l s ar al -
s al s ar al os s. o al ra or l ly r o -
s a r a oo ra s, s as r a oo a y. or o r,
ra or r o s a ro a s r ly o o s a o , o all -
ra s ar al . ra o o , say, a ly a s s as a r
o o o y a o s ra o o a lo - r l ar r .

QUICK REVIEW

- All else equal, immigration reduces wages, increases domestic output, and increases business income in the receiving nation; it has the opposite effects in the sending nation.
- Assessing the effects of immigration is complicated by such factors as unemployment, backflows and remittances, and fiscal impacts.

The LAST word

ORCHESTRATING IMPARTIALITY

Have "blind" musical auditions, in which screens are used to hide the identity of candidates, affected the success of women in obtaining positions in major symphony orchestras?

There have long been allegations of discrimination against women in the hiring process in some occupations, but such discrimination is usually difficult to demonstrate. Economists Claudia Goldin and Cecilia Rouse spotted a unique opportunity for testing such discrimination as it relates to major symphony orchestras. In the past, orchestras relied on their musical directors to extend invitations to candidates, audition them, and handpick new members. Concerned with the potential for hiring bias, in the 1970s and 1980s orchestras altered the process in two ways. First, orchestra members were included as judges, and, second, orchestras began open competitions using blind auditions with a physical screen (usually a room divider) to conceal the identity of the candidates. (These blind auditions, however, did not extend to the final competition in most orchestras.) Did the change in procedures increase the probability of women being hired?

To answer this question, Goldin and Rouse studied the orchestral management files of auditions for eight major orchestras. These records contained the names of all candidates and identified those who had advanced to the next round, including the ultimate winners of the competition. The researchers then looked for women in the sample who had competed in auditions both before and after the introduction of the blind screening.

A strong suspicion existed of bias against women in hiring musicians for the nation's finest orchestras. These positions are highly desirous, not only because they are prestigious but also because they offer high pay (often more than $75,000 annually). In 1970 only 5 percent of the members of the top five orchestras were women, and many music directors publicly suggested that women players, in general, have less musical talent.

The change to screens provided direct evidence of past discrimination. The screens increased by 50 percent the probability that a woman would be advanced from the preliminary rounds. The screens also greatly increased the likelihood that a woman would be selected in the final round. Without the screens about 10 percent of all hires were women, but with the screens about 35 percent were women. Today, about 25 percent of the membership of top symphony orchestras are women. The screens explain from 25 to 45 percent of the increases in the proportion of women in the orchestras studied.

Was the past discrimination in hiring an example of statistical discrimination based on, say, a presumption of greater turnover by women or more leaves for medical (including maternity) or other reasons? To answer that question, Goldin and Rouse examined information on turnover and leaves of orchestra members between 1960 and 1996. They found that neither differed by gender, so leaves and turnover should not have influenced hiring decisions.

Instead, the discrimination in hiring seemed to reflect a taste for discrimination by musical directors. Male musical directors apparently had a positive discrimination coefficient *d*. At the fixed (union-determined) wage, they simply preferred male musicians, at women's expense.

Source: Claudia Goldin and Cecilia Rouse, "Orchestrating Impartiality: The Impact of 'Blind' Auditions on Female Musicians," *American Economic Review*, September 2000, pp. 715–741.

CHAPTER SUMMARY

1. The term "labour" encompasses all people who work for pay. The wage rate is the price paid per unit of time for labour. Labour earnings comprise total pay and are found by multiplying the number of hours worked by the hourly wage rate. The nominal wage rate is the amount of money received per unit of time; the real wage rate is the purchasing power of the nominal wage.
2. The long-run growth of real hourly earnings —the average real wage—roughly matches that of productivity, with both increasing over the long run.
3. Global comparisons suggest that real wages in Canada are relatively high, but not the highest, internationally. High real wages in the advanced industrial countries stem largely from high labour productivity.
4. Specific wage rates depend on the structure of the particular labour market. In a competitive labour market, the equilibrium wage rate and level of employment are determined at the intersection of the labour supply curve and labour demand curve. For the individual firm, the market wage rate establishes a horizontal labour supply curve, meaning that the wage rate equals the firm's constant marginal resource cost. The firm hires workers to the point where its MRP equals this MRC.
5. Under monopsony the marginal resource cost curve lies above the resource supply curve because the monopsonist must bid up the wage rate to hire extra workers and must pay that higher wage rate to all workers. The monopsonist hires fewer workers than are hired under competitive conditions, pays less-than-competitive wage rates (has lower labour costs), and thus obtains greater profit.
6. A union may raise competitive wage rates by (a) increasing the derived demand for labour, (b) restricting the supply of labour through exclusive unionism, or (c) directly enforcing an above-equilibrium wage rate through inclusive unionism.
7. In many industries the labour market takes the form of bilateral monopoly, in which a strong union sells labour to a monopsonistic employer. The wage-rate outcome of this labour market model depends on union and employer bargaining power.
8. On average, unionized workers realize wage rates 10 to 15 percent higher than comparable nonunion workers.
9. Economists disagree about the desirability of the minimum wage as an antipoverty mechanism. While it causes unemployment for some low-income workers, it raises the incomes of those who retain their jobs.
10. Wage differentials are largely explainable in terms of (a) marginal revenue productivity of various groups of workers; (b) noncompeting groups arising from differences in the capacities and education of different groups of workers; (c) compensating wage differences, that is, wage differences that must be paid to offset nonmonetary differences in jobs; and (d) market imperfections in the form of lack of job information, geographical immobility, union and government restraints, and discrimination.
11. The principal–agent problem arises when workers provide less-than-expected effort. Firms may combat this by monitoring workers, by creating incentive pay schemes that link worker compensation to effort, or by paying efficiency wages.
12. Discrimination relating to the labour market occurs when women or minorities having the same abilities, education, training, and experience as men or white workers receive inferior treatment with respect to hiring, occupational choice, education and training, promotion, and wage rates. Forms of discrimination include wage discrimination, employment discrimination, occupational discrimination, and human capital discrimination. Discrimination redistributes national income and, by creating inefficiencies, diminishes its size.
13. In the taste-for-discrimination model, some white employers have a preference for discrimination, measured by a discrimination coefficient *d*. Prejudiced white employers will hire visible-minority workers only if their wages are at least *d* dollars below those of whites. The model indicates that declines in the discrimination coefficients of white employers will increase the demand for visible-minority workers, raising the visible-minority wage rate and the ratio of visible-minority wages to white wages. It also

suggests that competition may eliminate discrimination in the long run.

14. Statistical discrimination occurs when employers base employment decisions about *individuals* on the average characteristics of *groups* of workers. That practice can lead to discrimination against individuals even in the absence of prejudice.

15. The crowding model of occupational segregation indicates how white males gain higher earnings at the expense of women and minorities who are confined to a limited number of occupations. The model shows that discrimination also causes a net loss of domestic output.

16. Government antidiscrimination legislation and policies involve direct governmental intervention, including the requirement that these firms enact employment equity programs to benefit women and certain minority groups.

17. Those who support employment equity say it is needed to help compensate women and minorities for decades of discrimination. Opponents say employment equity causes economic inefficiency and reverse discrimination.

18. Supply and demand analysis suggests that the movement of migrants from a poor country to a rich country (a) increases domestic output in the rich country, (b) reduces the average wage in the rich country, and (c) increases business income in the rich country. The opposite effects occur in the poor country, but the world as a whole realizes a larger total output.

19. The outcomes of immigration predicted by simple supply and demand analysis become more complicated on consideration of (a) the costs of moving, (b) the possibility of remittances and backflows, (c) the level of unemployment in each country, and (d) the fiscal impact on the taxpayers of each country.

TERMS AND CONCEPTS

nominal wage, p. 376
real wage, p. 376
purely competitive labour market, p. 379
monopsony, p. 382
exclusive unionism, p. 387
occupational licensing, p. 388
inclusive unionism, p. 388
bilateral monopoly, p. 390
minimum wage, p. 391
wage differentials, p. 393
marginal revenue productivity, p. 393
noncompeting groups, p. 394
investment in human capital, p. 395
compensating differences, p. 395
incentive pay plan, p. 397
wage discrimination, p. 399
employment discrimination, p. 400
occupational discrimination, p. 400
human capital discrimination, p. 400
taste-for-discrimination model, p. 400
discrimination coefficient, p. 401
statistical discrimination, p. 403
occupational segregation, p. 404
employment equity, p. 407
reverse discrimination, p. 408
legal immigrants, p. 408
illegal immigrants, p. 408

STUDY QUESTIONS

1. Explain why the general level of wages is high in Canada and other industrially advanced countries. What is the single most important factor underlying the long-run increase in average real-wage rates in Canada?

2. Why is a firm in a purely competitive labour market a *wage-taker*? What would happen if that firm decided to pay less than the going market wage rate?

3. KEY QUESTION Describe wage determination in a labour market in which workers are unorganized and many firms actively compete for the services of labour. Show this situation graphically, using W_1 to indicate the equilibrium wage rate and Q_1 to show the number of workers hired by the firms as a group. Show the labour supply curve of the individual firm and compare it with that of the total market. Why are there differences? In the diagram representing the firm, identify total revenue, total wage cost, and revenue available for the payment of nonlabour resources.

4. **KEY QUESTION** Complete the following labour supply table for a firm hiring labour competitively:

Units of labour	Wage rate	Total labour cost (wage bill)	Marginal resource (labour) cost
0	$14	$______	
1	14	______	$______
2	14	______	______
3	14	______	______
4	14	______	______
5	14	______	______
6	14	______	______

   a. Show graphically the labour supply and marginal resource (labour) cost curves for this firm. Explain the relationship of these curves to one another.

   b. Plot the labour demand data of question 2 in Chapter 14 on the graph used in a. What are the equilibrium wage rate and level of employment? Explain.

5. Suppose the formerly competing firms in question 3 form an employers' association that hires labour as a monopsonist would. Describe verbally the effect on wage rates and employment. Adjust the graph you drew for question 3, showing the monopsonistic wage rate and employment level as W_2 and Q_2, respectively. Using this monopsony model, explain why hospital administrators sometimes complain about a shortage of nurses. How might such a shortage be corrected?

6. **KEY QUESTION** Assume a firm is a monopsonist that can hire its first worker for $6 but must increase the wage rate by $3 to attract each successive worker. Draw the firm's labour supply and marginal labour cost curves and explain their relationships to one another. On the same graph, plot the labour demand data of question 2 in Chapter 14. What are the equilibrium wage rate and level of employment? Why do these differ from your answer to question 4?

7. **KEY QUESTION** Assume a monopsonistic employer is paying a wage rate of W_m and hiring Q_m workers, as indicated in Figure 15-8. Now suppose an industrial union is formed that forces the employer to accept a wage rate of W_c. Explain verbally and graphically why in this instance the higher wage rate will be accompanied by an increase in the number of workers hired.

8. Have you ever worked for the minimum wage? If so, for how long? Would you favour increasing the minimum wage by a dollar? by two dollars? by five dollars? Explain your reasoning.

9. "Many of the lowest-paid people in society—for example, short-order cooks—also have relatively poor working conditions. Hence, the notion of compensating wage differentials is disproved." Do you agree? Explain.

10. What is meant by investment in human capital? Use this concept to explain (a) wage differentials, and (b) the long-run rise of real wage rates in Canada.

11. What is the principal–agent problem? Have you ever worked in a setting where this problem arose? If so, do you think increased monitoring would have eliminated the problem? Why don't firms simply hire more supervisors to eliminate shirking?

12. **KEY QUESTION** The labour demand and supply data in the table below relate to a single occupation. Use them to answer the questions that follow. Base your answers on the taste-for-discrimination model.

Quantity of labour demanded, thousands	Visible minority wage rate	Quantity of visible minority labour supplied (thousands)
24	$16	52
30	14	44
35	12	35
42	10	28
48	8	20

   a. Plot the labour demand and supply curves for visible minority workers in this occupation.

   b. What are the equilibrium visible minority wage rate and quantity of visible minority employment?

   c. Suppose the white wage rate in this occupation is $16. What is the visible minority-to-white wage ratio?

   d. Suppose a particular employer has a discrimination coefficient *d* of $5 per hour.

Will that employer hire visible-minority or white workers at the visible minority–white wage ratio indicated in part (c)? Explain.

   e. Suppose employers as a group become less prejudiced against visible minorities and demand 14 more units of visible-minority labour at each visible-minority wage rate in the table. What are the new equilibrium visible-minority wage rate and level of visible-minority employment? Does the visible minority–white wage ratio rise or fall? Explain.

   f. Suppose visible minorities as a group increase their labour services in that occupation, collectively offering 14 more units of labour at each visible-minority wage rate. Disregarding the changes indicated in part (e), what are the new equilibrium visible-minority wage rate and level of visible-minority employment? Does the visible minority–white wage ratio rise, or does it fall?

13. Males under the age of 25 must pay far higher auto insurance premiums than females in this age group. How does this fact relate to statistical discrimination? Statistical discrimination implies that discrimination can persist indefinitely, while the taste-for-discrimination model suggests that competition might reduce discrimination in the long run. Explain the difference.

14. KEY QUESTION Use a demand and supply model to explain the effect of occupational segregation or crowding on the relative wage rates and earnings of men and women. Who gains and who loses from the elimination of occupational segregation? Is there a net gain or a net loss to society? Explain.

15. "Current employment equity programs are based on the belief that to overcome discrimination, we must practise discrimination. That perverse logic has created a system that undermines the fundamental values it was intended to protect." Do you agree? Why or why not?

16. Suppose Ann and Becky are applicants to your university and that they have identical admission qualifications. Ann who is a member of a visible minority, grew up in a public housing development; Becky, who is white, grew up in a wealthy suburb. You can admit only one of the two. Which would you admit and why? Now suppose that Ann is white and Becky is a member of a visible minority, all else being equal. Does that change your selection? Why or why not?

17. KEY QUESTION Use graphical analysis to show the gains and losses resulting from the migration of workers from a low-income country to a high-income country. Explain how your conclusions are affected by (a) unemployment, (b) remittances to the home country, (c) backflows of migrants to their home country, and (d) the personal characteristics of the migrants. If the migrants are highly skilled workers, is there any justification for the sending country to levy a brain drain tax on emigrants?

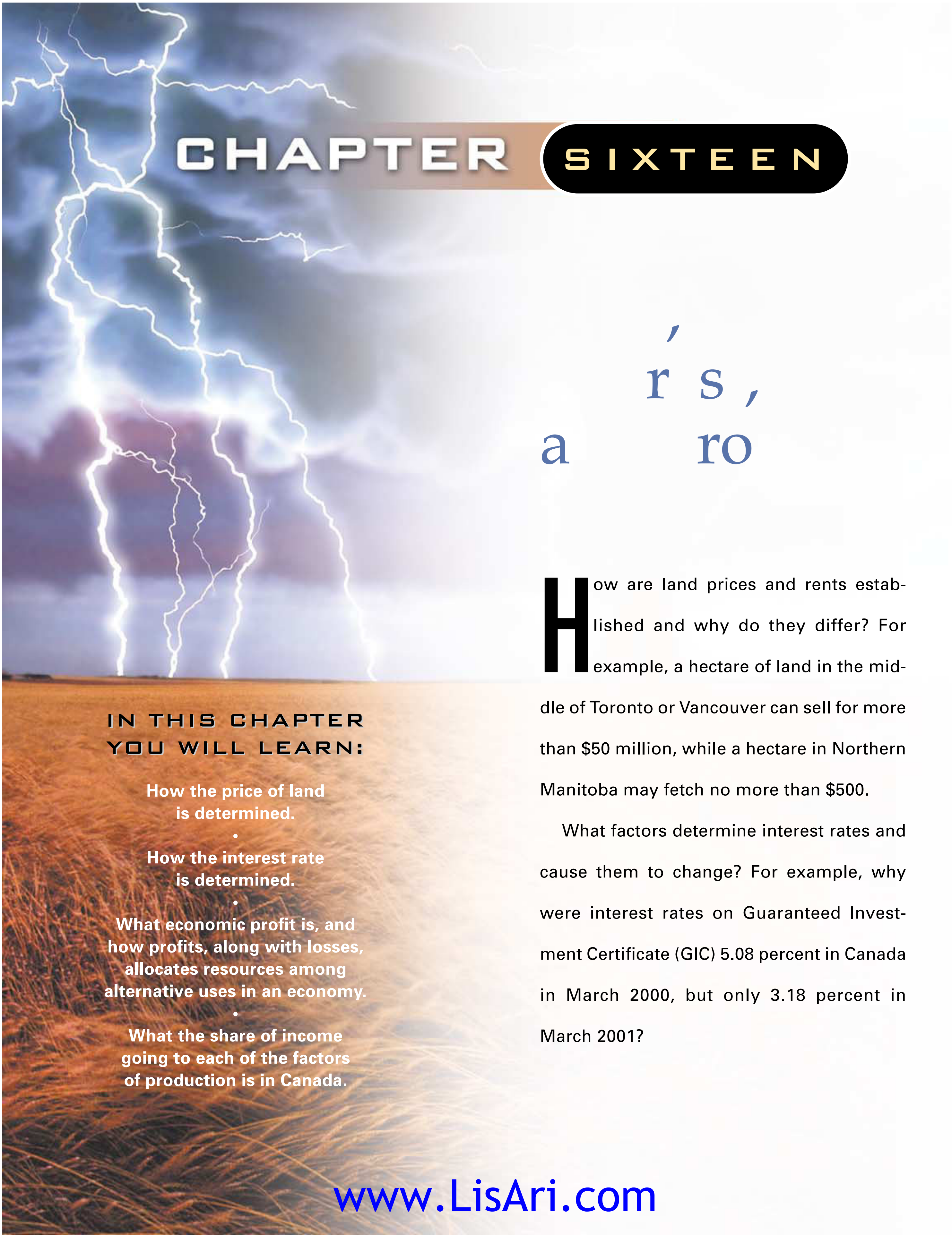
18. Evaluate: "If Canada deported, say, 100,000 illegal immigrants, the number of unemployed workers in Canada would decline by 100,000."

19. If a person favours the free movement of labour within Canada, is it then inconsistent to also favour restrictions on the international movement of labour? Why or why not?

20. **(The Last Word)** What two types of discrimination are represented by the discrimination evidenced in this chapter's The Last Word?

INTERNET APPLICATION QUESTION

1. Go to <espn.go.com/golfonline> and select *Tours, Rankings*, and *Money leaders*. What are the annual earnings to date of the top 10 male golfers on the PGA tour? What are the earnings of the top 10 female golfers on the LPGA tour? What are the general differences in earnings between the male and female golfers? Can you explain them?



CHAPTER SIXTEEN

r′s ,
a ro

IN THIS CHAPTER YOU WILL LEARN:

How the price of land is determined.

•

How the interest rate is determined.

•

What economic profit is, and how profits, along with losses, allocates resources among alternative uses in an economy.

•

What the share of income going to each of the factors of production is in Canada.

How are land prices and rents established and why do they differ? For example, a hectare of land in the middle of Toronto or Vancouver can sell for more than $50 million, while a hectare in Northern Manitoba may fetch no more than $500.

What factors determine interest rates and cause them to change? For example, why were interest rates on Guaranteed Investment Certificate (GIC) 5.08 percent in Canada in March 2000, but only 3.18 percent in March 2001?

a ar so r s o ro s a loss s y o ro s a o r or a l , y or l or s' r y 2 . r 1 , r as or l or ora o 's r r as a los o y r a y ar a r 1 o s o a s a salar s, a o or r o a o al o a a a. s a r a o r r so r ay- s r , r s , a ro a o r s r a 2 r o a o al o . y loo a r .

ECONOMIC RENT

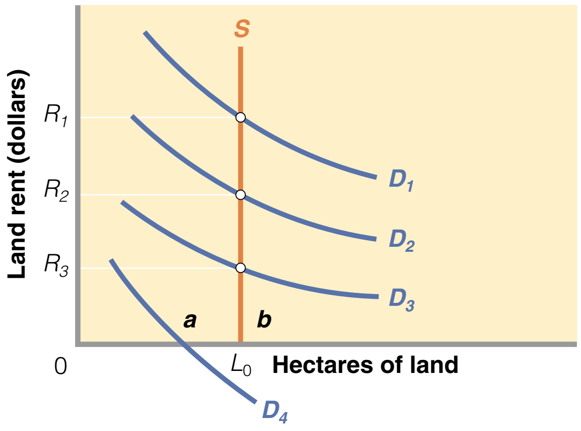
o os o l , r a s o y y s ay or s o a a ar or a roo . o s ss , r s a ay a or s o a a- ory l , a , or ar o s a l y. o s o r a o- s a a o s, o r. or ory roo r , or a l , ay l o r ay s as ll r s o o y rs y orro o a or ory, a s or s o al s r s, l y ay s, a so o . o o ss s r a arro r s s . **Economic rent** s r a or s o la a o r a ral r so r s a ar o l ly o al s - ly. s yo ll s , s o rall s ly s s s r al ay s ro a , r s , a ro ay s.

<www.theshortrun.com/classroom/glossary/micro/rent.html>
Economic rent

ECONOMIC RENT The price paid for the use of land and other natural resources, the supply of which is fixed (perfectly inelastic).

's a s a a so o s l a o s ro s ly a a a alys s. rs ass a all la s o sa ra or al y, a a a ara l (lla l) ar o la s as ro as ry o r ar . ass , oo, a all la as a s l s , or a l , ro a . s os a la s r or l as a o ar a y ro- rs ar a la a a y la o rs ar o r la ar . r 1 -1, r *S* r r s s s ly o ara l la a a la l o- o y as a ol , a r *D*₂ r r s s a o ro rs or s o a la . s all o o r so r s, s a s r ro a or ro ro . a r or la s o ar slo a s o s r r s a a s , or ro rs as a ro , ro r s r o s ll a o al s o o .

FIGURE 16-1



Because the supply S of land (and other natural resources) is perfectly inelastic, demand is the sole active determinant of land rent. An increase in demand from D_2 to D_1 or a decrease in demand from D_2 to D_3 will cause a considerable change in rent: from R_2 to R_1 in the first instance and from R_2 to R_3 in the second. But the amount of land supplied will remain at L_0. If demand is very weak (D_4) relative to supply, land will be a free good, commanding no rent.

Perfectly Inelastic Supply

a r o o r a alyss so s lys . or all ra al r os s s ly o la s r ly las (o s or r a lo r), as r s ly r *S*. a as o ro o os s a r a o r- ro l o a r . o o y as o ly so la , a a 's a . o rs , l s a y ar l o la a a or sa l y l ar , ra a , a rr a o , s ar a al ro s a o a s a o o la s l . r as s sa l y o la a o ly a s all ra o o o al a o o la a o o a as a a la a o r a- ral r so r s ar s ly.

Changes in Demand

a s s ly o la s , a s o ly a r a o la r s ly s ass . a r s a or la a ors s ss a r 1 o r o ro ro o la , ro- y o la (s ar o a y a al y o r so r s la s o), a r s o o rr so r s a ar o la .

a or la r 1 -1 r as ro D_2 o D_1, la r o l r s ro R_2 o R_1. a or la l ro D_2 o D , la r o l all ro R_2 o R . r as , a o o la s l o l r a sa a a y L_0. a s o o r a o o a o o la a a la l s s ly o la a o a . a or la r o ly D , la r o l ro. a o l a *f ee good* a oo or a s so a r la o s ly a r s a ss s ly o ar r s ro. r 1 -1, s o s ss s ly as s a *b a a r* o ro. s ss ally as s a o r -la ra o a a a s ory.

as rly r 1 -1 l a s r o o o r a r-o s- o s. a r s a r s ar so alo as as s r , or a l , a s a or a la s r o s s a a l o ro - o ally r ro a l , lo , a r a . o ras , a or sola la l o s r s ly l a s ry l l r a ra ro s s . (s a r ly r a r, o o rs , ol a ro la , as s r o so sola la s a a a s!)

Land Rent: A Surplus Payment

r ly las s ly o la s o ras r la ly las s ly o a al, s as a ar l s, a ry, a ar o s s. lo r , a al s *no* o al s ly. r r s r r rs o o s r a o r lar r a s o ro r y r so r s. o rs ly, a l r ss l rs o allo s a l s o r a a o r la . s ly r s o s o la r so r s ar ar slo , a a r s a o s r so r s a a **incentive function**. r ro s a o o r or o r so r , r as a lo r ro s r so r s l rs o o r l ss.

INCENTIVE FUNCTION OF PRICE The inducement that an increase in the price of a commodity gives to sellers to make more of it available (and conversely for a decrease in price).

o so la . s r s o o , a s o al s ly o la s . r r s $10,000, $ 00, $1, or $0 r ar , sa a o o la s a a la l o so y or s ro o , s y o o s s o s r r a *l a men* o ssary o s r a la s a a la l o o o y as a ol .

Application: A Single Tax on Land

la s a o a r , os s o o ro , a o l a a la l o r al ay s, y s o l r a o os o y s or al a - , y r a , or y roo a o la o rs o al s s a lo ar a all la r s ar ar o s. y ar a la s o l a o al (o y s a) so a a y ay s or s s a s y o r o r r ll- o r o la o ra r a s y a la o or y.

HENRY GEORGE'S PROPOSAL

SINGLE-TAX MOVEMENT A movement spearheaded by Henry George in the late nineteenth century to make taxes on rental income the only tax levied by government; few advocates remain.

a s, r s o r al ay s as a or o a **single-tax movement,** a s a s or la ry. ar- a y ry G or 's ro o a oo *P og e and Po e* (1), s or - rs o s r or o l a o o r o l a ly a , or a a ay, o s a a la l s ly o la or, r or , ro- o al o o o y as a ol .

G or o s r a as o la o r a o ra ro r los , la o rs oy lar r a lar r r s ro r la ol s. a r as r s as r s l o a ro a or a r so r os s ly as r- ly las . o la lor s r r a lo sly o s, o ro a y ro or , sol ly ro r o a a a o sly lo a la . G or s s a s r as s la r lo o o - o y l a la r ss o l a ly a a r s or - l s s. s o lar s or or s as o la a a o , G or ro os a a s o r al o *onl* a l y o r .

G or 's as or a la as as o o ly o y or a r ss also o y. a s, a a o la s a s , l r ally ry o r a , o s o al r s o r so r a . a o a s r s a r- a a s a ay a o or a al o s o or or a $10 or - a a ay o r r a o a r s a o a a r- a $. larly, a ro r y a o l s lo rs r r s o s ors s ro r y a a s so o loo or o r s s, os r allo a o so r so r s o r la s a . os ro a l s o la or s a r a s os ro a l s a r s a . o rs , a la lor o l ra la ro ro o a a s os , a o l a o r al o a all. , so r al o , o a r o s all, s r a o .

CRITICISMS

ry a o a s o a s l a o la r a . r s o a a o o ollo

- rr l ls o o r s ar s a a la a alo o l o r o r s r al s o o s r as a s l a .
- os o ay s o s s o a r o s l s as r s , r , a s, a ro s. a s y ally ro so ay, a o o r a o r a ly s a l ro ay s or s ro s.

o, ra , o l l o r o o a y s o ay a ally a o o o o r .

- o- all *nea ned income* a r s o a y o l o r a la o rs, s ally o o y s ro . or a l , o s r a al a s o r y so o o, so 20 or 2 y ars a o, a o r as (or r) s o a r a as r ra ro ro . s s o or ar a r al o o la o r
- s or ally, a o la s l ly o a a o rs a y s. or r o rs ay a ar s o as r as s al o la (a la r). o l ar ly a r o os a a y a o rr o rs o a o ar r or la .

Productivity Differences and Rent Differences

o ar a ass a all s o la ar o sa ra . a s la ly o so. r s o la ary r a ly ro y, o so l r- l y a o s l a a ors as ra all a ra r . a ors la , or a l , y o r ar o so l s ll ly s o or ro o , y ra r s ar l ss ll s , a y o s arly a a l o or ro o . ro y r s ar r r so r a a r s. o y ro rs ll s a l s a r or ly ro- o r ar o la l ss ro ra r la ll o a a lo r r a o la ay o a o r a all.

o a o s l ay s as or a la r s la r . r s al, r rs ll ay or or a o la a s s ra ally lo a r s o a r als, la o r, a s o rs a y ll or a o la os lo a o s r o ro s s. or a l , or o sly la r s ar a or a or s r sor s a la a as o l r .

r 1 -1, ro a sl ly r rs , r als r r- als ro al y r s la . ss , a a , a o ly a a ro- o o r ra s o la , a o s a a la l a o L_0. o al a o s o la o r, a al, a r r r al al- , ro y or, or s ally, ar al r ro o a o o r ra s o la s r a r s D_1, D_2, D , a D . Gra 1 la s os ro , as s o y D_1, l ra s l as ro , as s o y D . r s l o o r s or ra s 1, 2, a la ll R_1, R_2, a R , r s ly r r al ll rror r s ro y o r ra s o la . Gra la s so oor al y a , ss ly *S*, ar rs o ’ ay a y o s . ll a r oo a s s o s - ly s ar r la o o a or o o a a r or a r .

Alternative Uses of Land

a ass a la as o ly o s . ally, o a la or ally as al r a s s. ar o ar o ar la ay s l or ra s o o ly or also or ra s or , oa s, arl y, a a l or ay s l or l - a o s , or a ay, or as a a ory s . o r or s, a y ar lar s o la ol s a o or y os or o ro o ro s s o r so r . r r ar al r a s s, al r s s ay r o o r os o or y os s o s r s o la or r ar lar r os . o al r , r s a os o ro o , s as a s a r s ar .

all a , as y so y, o o r s o a os . o y o l a sa a o o la or o ay o o o r . ro so - y's rs , o o r s a s r l s ay a o a o a s o a r so r . al r s o o ay r o a ra la r so r s a ay ro al r a s s. or r s, r al ay s ar a co . (*Key Question 2*)

QUICK REVIEW

- Economic rent is the price paid for resources such as land whose supply is perfectly inelastic.
- Land rent is a surplus payment because land would be available to society even if this rent were not paid.
- The surplus nature of land rent served as the basis for Henry George's single-tax movement.
- Differential rents allocate land among alternative uses.

INTEREST

In e e i he ice aid fo he e of mone . s r a orro rs o ay l rs or ra s rr r as o r ro r s o r . a o o as a o o o y a s a or s o $1 or o y ar. o o s ar or a o s s ss o .

1. ***Interest is stated as a percentage.*** r s s a a s, o y (r- s) s a or loa o o y. or a r aso , r s s y ally s a as a r a o a o o o y orro ra r a as a ollar a o . s l ss l sy o say a r s s 12 r a ally a o say a r- s s $120 r y ar r $1000. lso, s a r s as a r a a s as r o o ar r s a o loa s o r a o s. y r ss r s as a r a , a a ly o ar a r s ay o , say, $ 2 r y ar r $2 0 o o $1 00 r y ar r $12,000. o r- s ay s ar 1 r r y ar, s o o o s ro a al ol- lar r s. s r s o 1 r r y ar s r rr o as a 1 r r s ra .
2. ***Money is not a resource.*** o y s *no* a o o r so r . or o o s, a r rr y, or a o s, o y s o ro a o ro oo s a s r s. o r, s ss s y s o o y a s a s o a r a al oo s s as a or s, a ry, ar o s s, a so o . a l s l arly o o r o ro o . s, r s o o y a al, s ss s ar o r ly y s o r al a al oo s.

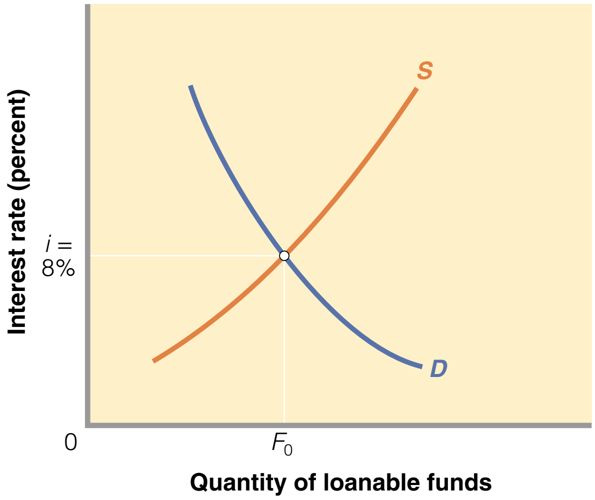
LOANABLE FUNDS THEORY OF INTEREST The concept that the supply of and demand for loanable funds determine the equilibrium rate of interest.

Loanable Funds Theory of Interest

a ro o o s r s ra s ro l s o o o y's o al s ly o a a or o y. s o r r s o s s o ro o- o s, ll s l o o s r a or ro- as ory o r s r . ally, **loanable funds theory of interest** la s r s ra o r s o o al s ly o a a or *mone* , ra r, r s o s ly o a a or *f nd a ailable fo lending (and bo o ing).* s r 1 -2 s o s,

FIGURE 16-2 THE MARKET FOR LOANABLE FUNDS

The upsloping supply curve *S* for loanable funds reflects the idea that at higher interest rates, households will defer more of their present consumption (save more), making more funds available for lending. The downsloping demand curve *D* for loanable funds indicates that businesses will borrow more at lower interest rates than at higher interest rates. At the equilibrium interest rate (here, 8 percent), the quantities of loanable funds lent and borrowed are equal (here, F_0 each).



l r r s ra (r , r) s ra a a s o loa - a l ss l a a ar al.

’s rs o s r loa a l s ory s l or . ally, ass o s ol s or o s rs ar sol s l rs o loa a l s a s - ss s ar sol a rs. lso ass a l o rs r ly o s ol s a s ss s r ar o r a a al s o s.

SUPPLY OF LOANABLE FUNDS

s ly o loa a l s s r r s y r *S* r 1 -2. s ar slo a s a o s ol s ll a a a la l a lar r a y o s a r s ra s a a lo r s ra s. os o l r r o s r o o r as l as ra l oo s a s r s *oda* , ra r a o lay r as s o so *f* *e.* or o l o lay o s o a r as r sa , y s o sa y a r s ay . lar r a o o a ay , r a r rral o o s ol o s o a s r a r a o o y a a a la l or loa s.

r s sa r a o o o s s as o o a y o loa - a l s a a a la l y s l rs a s r s o s o a s r- s ra . os o o s s sa as r la ly s s o a s r s ra . s ly r o loa a l s ay, r or , or las- a *S* r 1 -2 l s.

DEMAND FOR LOANABLE FUNDS

<www.mises.com/humanaction/chap19sec1.asp>
The phenomenon of interest

s ss s orro loa a l s r ar ly o a o r s o s o a al oo s, s as la s or ar o s s, a ry, a . ss a a r a s o y a a a ll r as o a sal s s a r ’s o al r ll r s y $110 or y ar. lso ass a a os s $100 a as a s l l o s o y ar. o ar $10 ar $100 os o a , a ra o r r o s s s 10 r ($10/$100) or o y ar.

o r r s o l ro a l a r s o l a , r s o ar r s ra r o loa a l s 10 r ra o r r . s a orro a so ra l ss a ra o r r , say, a r , as r 1 -2, s s ro a l a s o l a . s a orro o ly a a r s ra a o 10 r ra o r r , say, a 1 r , s s ro a l a s o l o a .

y s a or loa a l s o slo , as r 1 -2 r r s ra s r s ro s ll ro a l a a s all r a - y o loa a l s ll a . lo r r s ra s, or s ro s ll ro a l a , r or , or loa a l s ll a . , as a s s , s ro a l o r as $100 a s a orro a r o r s orro a 1 r .

Extending the Model

o a s s l o l or r al s s ral ays.

FINANCIAL INSTITUTIONS

o s ol s rar ly l r sa s r ly o s ss s a ar orro s or s . s a , y la r sa s ar r a s (a o r a al s o s). a s ay r s o sa rs o a ra loa a l s a r l os s o s ss s. s ss s orro s ro a s, ay r s or s o o y. a al s o s ro y ar - orro rs r r s ra s a r s ra s y ay sa rs. o r s ra s, o r, ar as o s ly o a a or loa a l s.

CHANGES IN SUPPLY

y a a s s o s ol s o r r ll ro o sa or a a r s ra , s s ly r r ar . or a l , r s ar o sa s r o s ly ro a a o , o l s ly o loa a l s o r as a l r r s ra o r as .

o rs ly, a l r ss o l s s ly-o -loa a l - s r l ar a r as l r r s ra . or a l , o - r a so al s ra o o r os s o os al a o , r s r - o r s, a r r l or lly, o o s ol s o sa s .

CHANGES IN DEMAND

a s , a y a r as s ra o r r o o al s - s ll r as a or loa a l s. ’s r r o o r arl r a - l , r a r o l r a o al r o $110 y r as a $100 a a , r or , o l r al a 10 r r r o s . a a - ors r as or r as ra o r r os a olo al a a ra s ro y o a so a r ’s o al r r as y $120 ra r a $110. ra o r r o l 20 r , o 10 r . or olo al a a , r o l a a ro loa a l s a , say, a r s ra o 1 r , o ll a $100 o loa a l s a a r s ra , a a a r or loa a l s as s o r .

larly, a r as o s r a or r 's ro ll r as r o s ro . o o ro y o a s a , s o al r ll r s ro $110 o r a s $120, r as r 's ra o r r ro 10 o 20 r . a , r ll ll o orro or a r o sly a o r r s or 1 r r s ra , ly a a r or loa a l s as s r ar . s s a r as s l r r s ra .

o rs ly, a l ro y or r o r 's ro o l s a r or loa a l s l ar , r l r r s ra .

OTHER PARTICIPANTS

s r o r ar o r ar a s o o a a s ly s s o loa a l s ar . or a l , l o s ol s ar s l rs o loa a l s, a y ar also a rs o s s. o s ol s orro o a s r as s s as o s , a o o l s, r r , a o s-ol a l a s. Go r s also ar o a s o loa a l s ar y orro o a ary s. s ss s a a r s ss o r rr r s ay o r so o os r s ar or loa a l s. s, l o s ol s, s ss s o ra o o s ly a a s s o ar .

<www.bankofcanada.ca/en/>
Bank of Canada

ally, a o o a r a a a a la l sa s o o s ol s, a s a o r a al s o s also r as s ro l ro ss a r as s loa s ar a a a o l o a a . a o a a a (a o 's ral a) o rols a o o s a a -y a s s r s ra s.

s a l s a s ro o o r a r-o s o s y r-s ra o o -y ar G ara s r a ro ro .0 r ar 2000 o .1 r ar 2001 r ar o r aso s (1) a or loa a l s r as a s s ss s o o r as or a al oo s a (2) a o a a a oo o ary a o s a r as s ly o loa a l s. (*Key Question 4*)

TABLE 16-1 SELECTED INTEREST RATES, JANUARY 2001

Type of interest rate	Annual percentage
10-year Government of Canada bond	5.43
New Brunswick 2008 bond	5.80
B.C. 2008 bond	5.73
Canadian Pacific 2009 bond	6.96
5-year closed mortgage	7.40
91-day Treasury bill (Government of Canada)	5.20
Prime rate (rate charged by banks to their best corporate customers)	7.50
Visa interest rate	18.50

Range of Interest Rates

l o o o s s o s a r s o a s l r s ra , a r o r s ra s s . a l 1 -1 l s s s ral r s ra s o r rr o a. s ra s ra ro . o 1 . 0 r . y ar r r s

- ***Risk*** oa s o r orro rs or r r os s arry ary r s o r s . r a r a a orro r ll o r ay loa , r r s ra l r ll ar o o sa or a r s .
- ***Maturity*** l o a loa or s *ma i* (s o a a) also a s r s ra . r s al, lo r- r loa s o a r r s ra s a s or r- r loa s.

lo - r l rs rs o a oss l a al sa r o or o al r a s s or o y or a r a r r o .

- ***Loan size*** r ar o loa s o al a r y a r s , r s ra o s all r o o loa s s ally ll r. os s o ss a lar loa a a s all loa ar a o sa ollars, os s r a r *a a e cen age* o s all r loa .
- ***Market imperfections*** ar r o s also la so r s ra r als. s all- o a a o o ol s lo al l ay ar r s ra s o o s r loa s a s o s ol s o a os ly o s o aro a a s s a s. lar or ora o , o r, a s r y r al l rs o oa a o ss a s r lo s o a a l ra .

Pure Rate of Interest

PURE RATE OF INTEREST An essentially risk-free, long-term interest rate not influenced by market imperfections.

o o s s a a al s al s s al o r s ra o s l y l s- r o ra s (a l 1 -1). y o so, y s ally a **pure rate of interest**. r ra s s a ro a y r s a o lo - r , r ally r s l ss s r s s as lo - r o s o a a a o r . s r s ay a o o as a sol ly or s o o y o r a , a s r s a a s ra os s ar l l a r s ra o s o s s o s or y ar r o s. r 2001 r ra o r s a a a as . 1 r .

<bonds.about.com/money/bonds/library/weekly/aa091699.htm> Yield spreads, thick and thin

Role of the Interest Rate

r s ra s a r al r a a s *le el* a *com o i ion* o s oo s ro o , as ll as *amo n* o & s .

INTEREST AND TOTAL OUTPUT

lo r l r r s ra o ra s s ss s o orro or or s- . s a r s l, o al s o o y r s s, a o o y as s r so r s, so o s o al o . o rs ly, a r l r r s ra s o ra s s ss ro orro or s , r s a o al s . a r as s ay s ra l a y o o y s r a o .

Go r o a la s r s ra o ry o a s a o o o a , or o r s a a o o o r. Go - r a s r s ra y a s ly o o y. r as s o y s ly r as s ly o loa a l s, a s l r r- s ra o all. s oos s s s a a s o o y. o - ras , r as s o y s ly r as s ly o loa a l s, oos l r r s ra . s a r s l, s s o s ra a so s o o y.

INTEREST AND THE ALLOCATION OF CAPITAL

r s ar ra o s. r o o y r s ra s r a ly o o . r s ra ra o s a a la l s ly o loa a l s o s- ro s a a ra s o r r a or a o r s ra os o orro s.

, say, o r s ry s o ar a r r o 12 r o o y s s ys al a al a a s r r r s a a r s ra o r , a orro a a s ys al a al. ra o r r o a o al a al s l s ry s o ly r , a s ry ll ro a l o a s a al a r r s . r s ra alloa s o y, a l a ly ys al a al, o os s r s ll os ro a , r or , os ro a l . a allo a o o a al oo s s so y.

r s ra o s o r ly ra o a al o s os ro s s. ar ol o ol s orro rs ay ra l a o orro rs o ass r s os s o o o s rs, a s y a a r s y o roll o - . lso, s , r s , a o o so y o r o lar or ora o s ay l o a so or a o ra l r s a a s all r r s, s all r r s a s lar ra s o ro a l y.

INTEREST AND THE LEVEL AND COMPOSITION OF R&D SPENDING

all ro a r 12 a , l s s o , s o o o o s o & s o os o orro s r la o s o ra o r r . r s al, lo r r s ra , a s lo r os o orro s or & , r a r a o o & s a s ro a l . r r s ra , l ss a o o & s .

lso, r s ra allo a s & s o os r s a s r s or ra o r r o & s r a s . ro r s ay a a ra o r r o 1 r o a & ro , l Glo a s as o ly a 2 r ra o r r o s & ro . rs ra a r , loa a l s ll o o , o o Glo . o y ll - y a & s allo a o ro s a a s ly ra s o r r o s y s s ar r s o r s or & ra r a or o r r os s.

NOMINAL AND REAL INTEREST RATES

NOMINAL INTEREST RATE The interest rate expressed in terms of annual amounts currently charged for interest and not adjusted for inflation.

REAL INTEREST RATE The interest rate expressed in dollars of constant value (adjusted for inflation); equal to the nominal interest rate less the expected rate of inflation.

s s ss o o rol o r s s s o s a & - s o s ass s a r s o a o . a o s s, s s s o al a r al r s ra s, s as o s s o al a r al a s a r 1 . **nominal interest rate** s ra o rs r ss ollars o rr al . **real interest rate** s ra o r s r ss r as o r ollars o a o -a s al . (or a o - ar so o o al r s ra s o a loa s s l o r s, s Glo al rs 1 .1.)

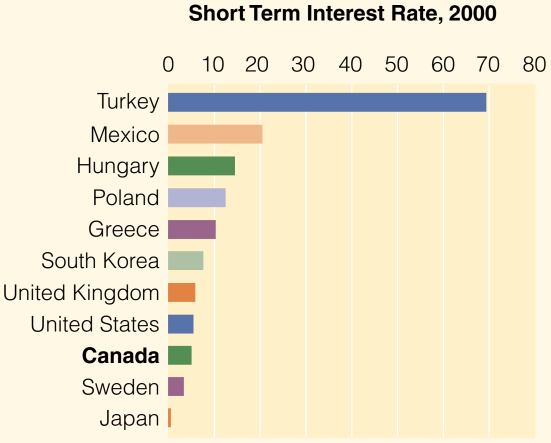
or a l , s os o al r s ra a ra o a o ar o 10 r . yo orro $100, yo s ay a $110 a y ar ro o . o r, a s o 10 r a o , a o s 110 ollars ll or 10 r l ss. s, r al al or r as o r o yo r $110 a o y ar s o ly $100. a o -a s ollars yo ar orro $100 a a y ar's yo ar ay a $100. l o al r s ra s 10 r , r al r s ra s ro. r s y s ra 10 r a o ra ro 10 r o al r s ra .

s r al r s ra , o o al ra , a a s s a & - s o s. (*Key Question 6*)

GLOBAL PERSPECTIVE 16.1

Short-term nominal interest rates, selected nations

These data show the short-term nominal interest rates (those on three-month loans) in various countries in 2000. Because these are nominal rates, much of the variation reflects differences in rates of inflation, but differences in central bank monetary policies and in risk of default also explain the variations.



Source: Organisation for Economic Co-operation and Development, <www.oecd.org/>, 2000.

Application: Usury Laws

USURY LAWS State laws that specify the maximum legal interest rate at which loans can be made.

ro rs o s a s (o a a a) a ass **usury laws,** s y a a r s ra a loa s a a . ros s o ol o r s os o orro , ar larly or lo - o or-ro rs. (*U* s ly a s or a r s .)

r 1 -2 l s s ass ss a o s l sla o . l r r-s ra s r , s os a s ry la s s a l rs a o ar or a r . s ar as ollo s

- ***Nonmarket rationing*** r , a y o loa a l s a s a y s l r s a s or a o loa a l s. ar r s ra o lo r a ra o a a la l loa a l s o or-ro rs, l rs (a s) a o o ra o . a o a loa s o ly o os r or y orro rs (a ly al y, - o o l), a s oal o s ry la . o - o , r s r orro -rs ar l ro ar a ay or o r o loa s ar s o ar ll ally r s ra s.
- ***Gainers and losers*** r or y orro rs a ro s ry la s a s y ay lo - ar r s ra s. rs (l a ly a s ar ol-rs) ar los rs, a s y r r ra r a r o a ollar l .
- ***Inefficiency*** a s s o l r r s ra allo a s o y o s s a & ro s os ra o r r s r a s . r s ry la s, s ar l ss l ly o allo a y a s o os ro ro s. os lso as a ro so ro-s s o l ay 10 r or s o a . as a l ss-ro s s , a o l ll o ay o ly r or a . ar r ra o s, lso ’s ly ro

ro o l a ’s o l o. a allo a o o s o l
r s o o lso a so y. a r s ry ra ,
ay o a or lso a r loa a l s a r-
, so, lso ay o . ally o roll r s ra s ay s
ly ra o s o l ss- ro s s or & ro s.

QUICK REVIEW

- Interest is the price paid for the use of money.
- In the loanable funds model, the equilibrium interest rate is determined by the demand for and supply of loanable funds.
- The range of interest rates is influenced by risk, maturity, loan size, taxability, and market imperfections.
- The equilibrium interest rate affects the total level of investment and, therefore, the levels of total spending and total output; it also allocates money and real capital to specific industries and firms. Similarly, the interest rate affects the level and composition of R&D spending.
- Usury laws that establish an interest rate ceiling below the market interest rate may (1) deny credit to low-income people, (2) subsidize high-income borrowers and penalize lenders, and (3) diminish the efficiency with which loanable funds are allocated to investment and R&D projects.

ECONOMIC PROFIT

a s r o s a rs a o o s s ro arro ly. o
a o a s, ro s a r a s o a r ’s o al r a r as a -
als a o r r s or a r als, a al, a la o r y a s l o
r . o o o s, s o o rs a s ro . r aso s a
a o a ’s o ro o s rs o ly **explicit costs** ay s a y r
o o s rs. or s **implicit costs** o ary o r sa r s
s s r so r s a o s, ra r a s ly os r so r s o ar .
o o s o s rs l os s o o or y os s a o r al
os s a s a o or r ro . **Economic**, or **pure**, **profit** s
a r a s a r all os s o l a l os s, la r l a
or al ro a s ra ro a r ’s o al r . o o ro
ay r os or a (a loss).
or a l , s os a s o r o s r o a l s o , l
la , l , a , a ro s r o la o r. s o o s s s ,
s rossly o rs a s r o o ro s r ly s ra s ro r o al r -
ay s s a s o o s rs or, say, a r s, l r y,
a s ra . as o y s ra os o r so r s *he* as o -
r . os os s ar r , r s , a a ay s s o l a
r y a r la , la o r, a a al r so r s a a la l or al r a
s s. y ar r l os s, a y s a o a o r -
r o o ro . r a ly o l a o ay os os s o s rs
s l s r so r s o r a l s o .

EXPLICIT COSTS The monetary payments a firm must make to an outsider to obtain a resource.

IMPLICIT COSTS The monetary incomes a firm sacrifices when it uses a resource it owns rather than supplying the resource to the market.

ECONOMIC (PURE) PROFIT The total revenue of a firm less its economic costs (which includes both explicit costs and implicit costs); also called above normal profit.

Role of the Entrepreneur

o o s s ro as r r o a ar lar y o a r so r r-
r r al a l y. o ro arl r a rs a r r r (1) o s
r so r s o ro a oo or s r , (2) a s as , o ro ol y s o s

<www.henrygeorge.org/cap.htm>
Capital, interest, and profit

NORMAL PROFIT The payment made by a firm to obtain and retain entrepreneurial ability.

or r , ( ) ro s o a o s or o ro s or ro - o ro ss s, a ( ) ars o o r s s asso a all os o s. ar o r r r's r r s a **normal profit,** s ay- ssary o r a r r r rr l o ro o . sa a r a or al ro s a os os o s r r r al a l y or a ar lar r os . sa also a a r 's o al r ay s o al os ss r a o all os s s s o o ro . s *e id al o* also o s o r r r. r r r s *e id al claiman* r so r a r s a s l a r all os s ar a .

y s o l r r s al ro a r oss l r aso s, o r la o r s s ol s ss a o as o o o oly o r.

Sources of Economic Profit

'S rs o s r a ar al o o ro o o ro o l ro. , y o o r al orl rs ro s a ro - , ll s r o o ro ar s s.

STATIC ECONOMY An economy in which resource supplies, technological knowledge, and consumer tastes are constant and unchanging.

a r ly o , s a o o y. **static economy** s o as or s s as r so r s l s, olo al o l , a o - s r as s ar o s a a a . s a r s l , all os a s ly a a, a all a a r a a, ar o s a .

G a r o s a a, o o r s r ly r a . o - o o a y r or ro o ol y a a ra ly r . r r or , o ro or ro o ro ss s r ro . r r o o a y o o ro or loss a a s a s ry ll sa ar ry or o r s lo r . ll os s, l a l , ar s o - r lo r , so o o o ro s s o r s a o o y.

a o ro o o ro a s a o o o y s s s a ro s l o y a a r o r al- orl a al s a s a o a y- r a y. or o r, a s a o o ro ay ar s ro a so r o r a r , o a , a r s - ar o so r r r. a so r s r s o so a o o o o oly o r.

INSURABLE RISK An event that would result in a loss but whose frequency of occurrence can be estimated with considerable accuracy.

UNINSURABLE RISK An event that would result in a loss and whose occurrence is uncontrollable and unpredictable.

RISK AND PROFIT

a r al, y a o o y r s o r a l r s r a y. s a s a r r r s ass r s s. o or all o o ro ay a r ar or ass r s s.

l o o ro r a y a r s - ar , s s - s r s s a ar s ra l a r s s a ar o. o y s o r s r , oo s, , a a s o loy s ar as ra l a s, r r y o o rr a s a a ra ly. r s a a o loss s o **insurable risks** y ay a a al (a s ra r) o a s ra o a y. r r r o ar s r s s.

o r, r r r s ar s ra l r s s o s ss, a os r s s ar a o al so r o o o ro . **Uninsurable risks** ar a ly o rolla l a r a l a s a a s ly o o s a r (a s r s a os s). s ra l r s s s ro r ral so r s

1. *Changes in the general economic environment* o r s ss (a r s- s o), or a l , a l a o r a ly r a , sal s, a r s, a

s o s ss loss s. ros ro s r ay r s loss s ro o a l o s o .

2. ***Changes in the structure of the economy*** o s r as s, olo y, r so r a a la l y, a r s a o s a ly r al orl , r a s ro o os s a r s. or a l , a a rl ar o o ro o y ar ay s ro l y ar as r s l o a s a r as r o l.

. ***Changes in government policy*** ly s r la o , r o al o a ar , or a a a a o al ol y ay s a ly al r os a r a a o a s ry a r s.

ar l ss o o s r a os a s o a o , y ar r s s a r a r r r s a o s ay s ss. *Some o all he economic o in a eal, d namic econom ma be com en a ion fo aking i k .*

INNOVATIONS AND PROFIT

r a s ar yo o rol o al r or s ry a s r al o . y a a r o a al s , o r o a o o rs a a o r r r. s ss r s l ra ly ro o s o ro o o a r os s a o ra ly a ro s o a r r s also a o ra ly. r r r os ly r a s o s s os a r a a a ay a ro s s o ro a l . a , r a y rs r . s a s ar s r ys, ro s or o a o s o s ro s ay o o a l r s. larly, o a y o ls, oo s, o s, a s s a a ar ry y ar, o ly a a l ar r lar ro s. or s o r a y r ro- o a ry ll a ally y l ro os o o s. s, o a o s r a y r r rs a l r a y a oss l y o loss s, o s o al or r as ro . *Some of he economic o in an inno a i e econom ma be com en a ion fo dealing i h he nce ain of inno a ion.*

MONOPOLY AND PROFIT

o ar, a l o o ro r a s s rro (1) y a ro o r r s s ar os , a (2) y a s- ss ro ss s y a s l s. *The e i ence of mono ol o e i a nal o ce of economic o .* a s a o o ol s a r s r o a r ry, ay rs s ly oy a o - o r s a o o ro a s s ro r la o os .

o o r a y a o o oly ar los ly r as so r s o o- o ro . r so o o oly o r a r s ss r s , or a l as a la o o r s a rs s, a s r as a rolo o o ro . r r or , a r a s o a o as a so r o o o oly o r a a a s o s s a s l a s o o ro .

or a s o ro s ro r a y a ro s ro o o oly as o o so al s ra l y o s o so r s o ro . ar s ss r s a r a o a o a r a o- o ro ar so ally s ra l o s. a o o oly ro s o so so ally s ra l , s s y ally o o r o , a o - o r s, a o o y. (***Key Question** 8*)

Functions of Profit

o o ro s a r ro a al s o o y. s o
l lo o o o a allo a o o r so r s a o al r a s s.

PROFIT AND TOTAL OUTPUT

a o o o o ro o a s r s o o a . o a o s -
la s s , r y r as o al o a loy . s,
rs o ro a s o o ro y ro o o a o .

PROFIT AND RESOURCE ALLOCATION

ro also l s o allo a r so r s a o al r a l s o ro o . r-
r rs s ro a s loss s. o rr o o o ro a s-
ry s a s al a so y a s a ar lar s ry o a . a ra s
r so r s ro s r s a ar o ro a l . r ar s o ro ar or
a a or a s ry o a y also a ra a a
r s or a s o . o ras , loss s al s ss s a a l o a s
r ro or s o oo s a s r s os r rr y s o rs.
oss s s al so y's s r or a s r s o o ra .
o, r s o o r a r-o s o , or l or s r lar
r a ro r as s a s s s ll r s s a
o al a so y r a ly a s. ro r as s als a so -
y a s or o s s ar r so r s allo a o a s . or l or ora o ,
o ras , as o ro s r al al o os s o r so r s
s o ro o a y r or s r a loss. loss s als a so -
y o l ro a r allo a o o so o os r so r s o so o r s .
ro s a loss s o o, o r, r s l a allo a o o r so r s a s r-
ly a o o s r r r s. r s o o o oly, or a l ,
s o o r s a r so r s ro s ry o s ry r s o s
o o o ro .

QUICK REVIEW

- Pure or economic profit is what remains after all explicit and implicit costs (including a normal profit) are subtracted from a firm's total revenue.
- Economic profit has three sources: the bearing of uninsurable risk, the uncertainty of innovation, and monopoly power.
- Profit and profit expectations affect the levels of investment, total spending, and domestic output; profit and loss also allocate resources among alternative uses.

INCOME SHARES

r s ss o s a r a r o l o o l o
a r r - a a o o o a a a a o al o s s r a o
a s, r , r s , a ro .
's loo a a l 1 -2. l o o a or s s o a ar o
o a ly o o o s o a s, r , r s , a ro s, y o

TABLE 16-2 RELATIVE SHARES OF DOMESTIC INCOME, 1926–2000 (SELECTED YEARS OR PERIOD AVERAGES OF SHARES FOR INDIVIDUAL YEARS)

Year or period	Wages, salaries, and supplementary labour income	Corporation profits before taxes	Interest and miscellaneous investment income	Accrued net income of farmers from farm production	Net income of nonfarm unincorporated business including rent	Inventory valuation adjustment	Net domestic income at factor cost
1926	55.3%	11.4%	3.2%	14.1%	14.9%	1.1%	100%
1929	60.0	12.9	3.7	8.0	15.7	–0.3	100
1937	62.6	15.6	3.1	6.9	13.9	–2.1	100
1941	61.9	18.1	2.8	7.0	12.6	–2.4	100
1945	63.4	13.1	2.7	9.2	12.0	–0.4	100
1951	60.7	17.9	2.5	10.5	12.0	–3.6	100
1957–60	67.0	13.7	3.9	3.6	12.0	–0.2	100
1961–65	67.7	14.2	4.3	3.6	10.6	–0.3	100
1966–70	70.9	13.5	4.7	2.7	8.8	–0.6	100
1971	73.0	12.2	5.5	2.0	8.2	–0.9	100
1973	70.6	16.0	5.7	3.0	7.2	–2.5	100
1975	71.2	14.8	7.1	2.9	6.0	–2.0	100
1979	69.3	16.4	10.7	1.7	5.4	–3.5	100
1982	72.7	9.2	12.2	1.2	5.8	–1.1	100
1990	72.6	8.7	11.1	0.6	7.0	–0.0	100
1994	73.5	10.0	10.1	0.4	6.9	–0.9	100
1999	75.2	10.5	5.0	0.2	6.2	2.9	100
2000	69.6	15.9	6.6	0.3	7.9	–0.3	100

o r 1 2 1 2 a s s a a a, *Na ional Income and E endi e Acco n* , al s a s 1 2 1 , a l 0 or o r y ars a s s a a a, *Na ional Income and E endi e Acco n* . or a s, s a s s a a a a .s a a . a/ l s / / o o y/ o o / o 0 .

s . ra ll. a/ oll / o ll or a a a .

Σ-STAT

ro s a o o s ar s a a a. o o a rol o la o r r so r a s la o r o a a a o o y. la o r o arro ly as a s a salar s, la o r r s a o 0 r o a o al o . so o o s s o a o o ro r ors s lar ly o os o l a s a salar s a s o l a o a s a salar s a ory o r la o r o . s s roa - o , la o r's s ar r s s o arly 0 r o a o al o , a r a a as r ar a ly s a l a a a s 1 2 . a l a s a o 20 r or a al s s or o r , r s , a ro . ro ally, a al s o s a r la ly s all s ar o a a a o o y, all a a al s sys .

The LAST word

DETERMINING THE PRICE OF CREDIT

A variety of lending practices may cause the effective interest rate to be quite different from what it appears to be.

Borrowing and lending—receiving and granting credit—are a way of life. Individuals receive credit when they negotiate a mortgage loan and when they use their credit cards. Individuals make loans when they open a savings account in a chartered bank or buy a bond.

It is sometimes difficult to determine exactly how much interest we pay and receive when we borrow and lend. Let's suppose that you borrow $10,000, which you agree to repay with $1000 of interest at the end of one year. In this instance, the interest rate is 10 percent per year. To determine the interest rate *i*, we compare the interest paid with the amount borrowed:

$$i = \frac{\$1000}{\$10{,}000} = 10\%$$

But in some cases a lender—say, a bank—will discount the interest payment at the time the loan is made. Thus, instead of giving the borrower $10,000, the bank discounts the $1000 interest payment in advance, giving the borrower only $9000. This increases the interest rate:

$$i = \frac{\$1000}{\$9000} = 11\%$$

While the absolute amount of interest paid is the same, in this second case the borrower has only $9000 available for the year.

An even more subtle point is that, to simplify their calculations, many financial institutions assume a 360-day year (twelve 30-day months), which means the borrower has the use of the lender's funds for five days less than the normal year. This use of a short year also increases the actual interest rate paid by the borrower.

The interest rate paid may change dramatically if a loan is repaid in installments. Suppose a bank lends you $10,000 and charges interest in the amount of $1000 to be paid at the end of the year. But the loan contract requires that you repay the $10,000 loan in 12 equal monthly installments. In effect, then, the average amount of the loan outstanding during the year is only $5000. Therefore:

$$i = \frac{\$1000}{\$5000} = 20\%$$

Here interest is paid on the total amount of the loan ($10,000) rather than on the outstanding balance (which averages $5000 for the year), making for a much higher interest rate.

Another factor that influences the effective interest rate is whether interest is compounded. Suppose you deposit $10,000 in a savings account that pays a 10 percent interest rate compounded seminannually. In other words, interest is paid on your loan to the bank twice a year. At the end of the first six months, $500 of interest (10 percent of $10,000 for half a year) is added to your account. At the end of the year, interest is calculated on $10,500 so that the second interest payment is $525 (10 percent of $10,500 for half a year). Thus:

$$i = \frac{\$1025}{\$10{,}000} = 10.25\%$$

This means that a bank advertising a 10 percent interest rate compounded seminannually is actually paying more interest to its customers than a competitor paying a simple (noncompounded) interest rate of 10.20 percent.

"Let the borrower (or depositor) beware" remains a fitting motto in the world of credit.

CHAPTER SUMMARY

1. Economic rent is the price paid for the use of land and other natural resources whose total supplies are fixed.
2. Rent is a surplus payment that is socially unnecessary since land would be available to the economy even without rental payments. The idea of land rent as a surplus payment gave rise to the single-tax movement of the late nineteenth century.
3. Differences in land rent result from differences in the fertility and climatic features of the land and difference in location.
4. Although land rent is a surplus payment rather than a cost to the economy as a whole, to individual firms and industries, rental payments are correctly regarded as costs. These payments must be made to gain the use of land, which has alternative uses.
5. Interest is the price paid for the use of money. In the loanable funds theory, the equilibrium interest rate is determined by the demand for and supply of loanable funds. Other things equal, an increase in the supply of loanable funds reduces the equilibrium interest rate, whereas a decrease in supply increases it; increases in the demand for loanable funds raise the equilibrium interest rate, whereas decreases in demand reduce it.
6. Interest rates vary in size because loans differ as to risk, maturity, amount, and taxability; market imperfections cause additional variations. The pure rate of interest is the interest rate on long-term, virtually riskless, Government of Canada long-term bonds.
7. The equilibrium interest rate influences the level of investment and helps ration financial and physical capital to specific firms and industries. Similarly, this rate influences the size and composition of R&D spending. The *real interest rate*, not the nominal rate, is critical to investment and R&D decisions.
8. Although designed to make funds available to low-income borrowers, usury laws tend to allocate credit to high-income persons, subsidize high-income borrowers at the expense of lenders, and lessen the efficiency with which loanable funds are allocated.
9. Economic, or pure, profit is the difference between a firm's total revenue and the sum of its explicit and implicit costs, the latter including a normal profit. Profit accrues to entrepreneurs for assuming the uninsurable risks associated with organizing and directing economic resources and for innovating. Profit also results from monopoly power.
10. Profit expectations influence innovation and investment activities and, therefore, the economy's levels of employment and economic growth. The basic function of profits and losses, however, is to allocate resources in accord with consumers' preferences.
11. The largest share of national income—about 70 percent—goes to labour, a share narrowly defined as "wages and salaries." When labour's share is more broadly defined to include "proprietors' income," it rises to about 80 percent of national income, leaving about 20 percent as capital's share.

TERMS AND CONCEPTS

economic rent, p. 418
incentive function of price, p. 419
single-tax movement, p. 420
loanable funds theory of interest, p. 422
pure rate of interest, p. 426
nominal interest rate, p. 427
real interest rate, p. 427
usury laws, p. 428
explicit costs, p. 429
implicit costs, p. 429
economic (pure) profit, p. 429
normal profit, p. 430
static economy, p. 430
insurable risks, p. 430
uninsurable risks, p. 430

STUDY QUESTIONS

1. How does the economist's use of the term "rent" differ from everyday usage? Explain: "Though rent need not be paid by society to make land available, rental payments are very useful in guiding land into the most productive uses."

2. **KEY QUESTION** Explain why economic rent is a surplus payment when viewed by the economy as a whole but as a cost of production from the standpoint of individual firms and industries. Explain: "Rent performs no 'incentive function' in the economy."

3. If money is not an economic resource, why is interest paid and received for its use? What considerations account for the fact that interest rates differ greatly on various types of loans? Use those considerations to explain the relative sizes of the interest rates on the following:

   a. A 10-year $1000 government bond

   b. A $20 pawnshop loan

   c. A 30-year mortgage loan on a $145,000 house

   d. A 24-month $12,000 bank loan to finance the purchase of an automobile

   e. A 60-day $100 loan from a personal finance company

4. **KEY QUESTION** Why is the supply of loanable funds upsloping? Why is the demand for loanable funds downsloping? Explain the equilibrium interest rate. List some factors that might cause it to change.

5. What are the major economic functions of the interest rate? How might the fact that many businesses finance their investment activities internally affect the efficiency with which the interest rate performs its functions?

6. **KEY QUESTION** Distinguish between nominal and real interest rates. Which is more relevant in making investment and R&D decisions? If the nominal interest rate is 12 percent and the inflation rate is 8 percent, what is the real rate of interest?

7. Historically, usury laws that put below-equilibrium ceilings on interest rates have been used in the United States to make credit available to poor people who could not otherwise afford to borrow. Critics contend that poor people are those most likely to be hurt by such laws. Which view is correct?

8. **KEY QUESTION** How do the concepts of accounting profit and economic profit differ? Why is economic profit smaller than accounting profit? What are the three basic sources of economic profit? Classify each of the following according to those sources:

   a. A firm's profit from developing and patenting a new medication that greatly reduces cholesterol and thus diminishes the likelihood of heart disease and stroke

   b. A restaurant's profit that results from construction of a new highway past its door

   c. The profit received by a firm due to an unanticipated change in consumer tastes

9. Why is the distinction between insurable and uninsurable risks significant for the theory of profit? Carefully evaluate: "All economic profit can be traced to either uncertainty or the desire to avoid it." What are the major functions of economic profit?

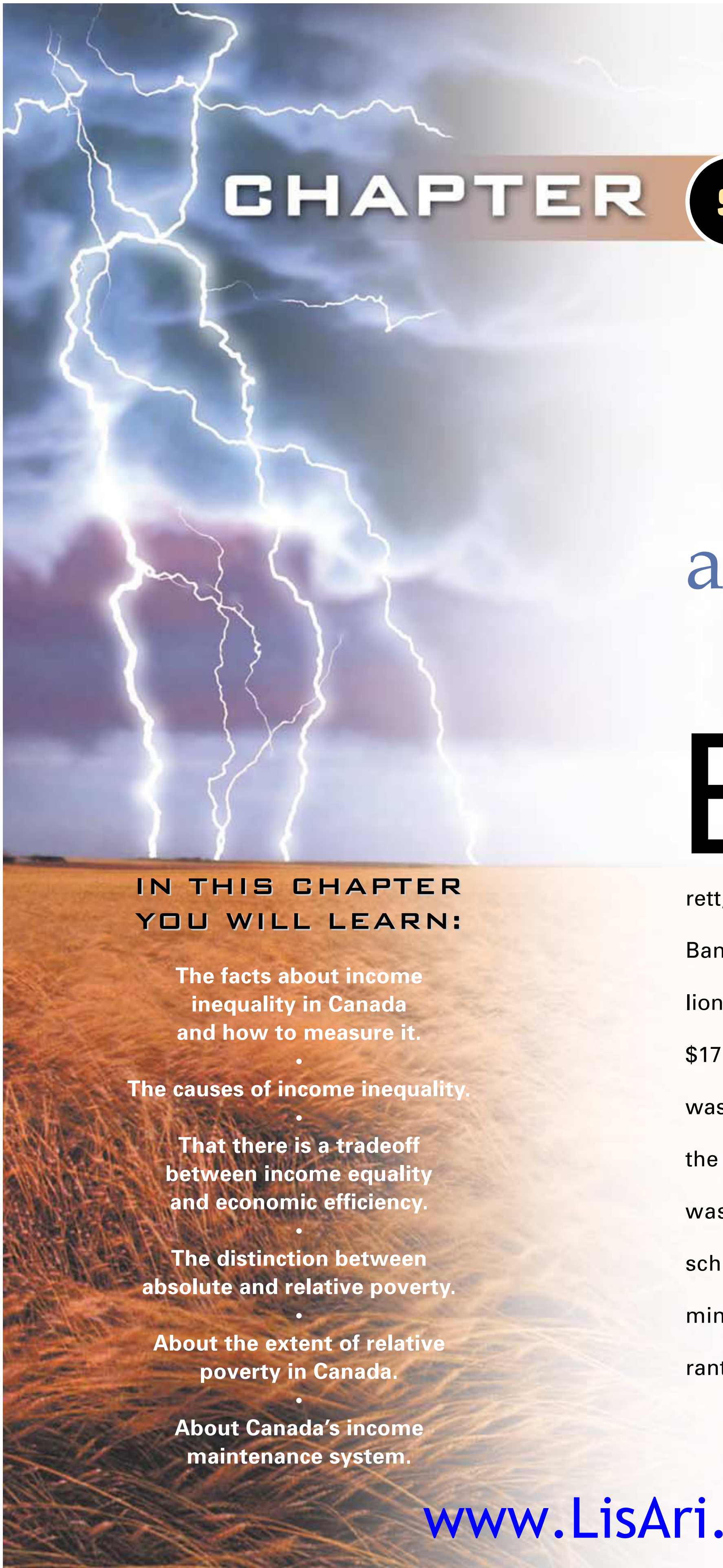
10. Explain the absence of economic profit in a purely competitive, static economy. Realizing that the major function of profit is to allocate resources according to consumer preferences, describe the allocation of resources in such an economy.

11. What is the rent, interest, and profit share of national income if proprietors' income is included within the labour (wage) share?

12. **(The Last Word)** Assume that you borrow $5000 and pay back the $5000 plus $250 in interest at the end of the year. Assuming no inflation, what is the real interest rate? What would the interest rate be if the $250 of interest had been discounted at the time the loan was made? What would the interest rate be if you were required to repay the loan in 12 equal monthly installments?

INTERNET APPLICATION QUESTION

1. The real interest rate is the nominal rate less the rate of inflation. Assume the Consumer Price Index (CPI) is a proxy for the inflation rate and one-year Treasury Bill rates represent the nominal interest rate. Find the current CPI at <www.statcan.ca/english/econoind/cpia.htm>, and then subtract it from the current one-year Treasury Bill rate <www.bank-banque-canada.ca/pdf/monmrt.pdf>. Repeat the process for the one-month Treasury Bills and the CPI rate of change for the past one month. Is there a difference between the 1-month and the 12-month real interest rates? If so, why is there a difference?



CHAPTER SEVENTEEN

o
al y
a o r y

IN THIS CHAPTER YOU WILL LEARN:

- The facts about income inequality in Canada and how to measure it.
- The causes of income inequality.
- That there is a tradeoff between income equality and economic efficiency.
- The distinction between absolute and relative poverty.
- About the extent of relative poverty in Canada.
- About Canada's income maintenance system.

Evidence that suggests wide income disparity in Canada is easy to find. In 1999 the annual paycheque of Mathew Barrett, the chief executive officer (CEO) of the Bank of Montreal totalled more than $20 million; the CEO of Canadian Tire received almost $17 million; and the CEO of Nortel Networks was paid more than $10 million. In contrast, the salary of the prime minister of Canada was $200,000 that year, and the typical schoolteacher earned $55,000. A full-time minimum-wage worker at a fast-food restaurant made about $12,000.

1 a o .2 ll o a a a s or 1 . r o o la o l o r y. r s o o la o r 0 r o o al o , l oor s r o ly r .

a ar so r so o al y s o al y r s or all s a a a a ro r ss a a s o r y a ar a or o a a ro ra s a a a s ar so o s o s a ll a s r s a r.

FACTS ABOUT INCOME INEQUALITY

INCOME INEQUALITY The unequal distribution of an economy's total income among households or families.

LORENZ CURVE A curve showing the distribution of income in an economy.

ra a ly o a a a s a o s orl 1 , as $, r a ly. a a ra lls s o a o o al y. o l ar a o a , s a o o s s r aro a ra .

Distribution of Personal Income by Income Category

ay o as r **income inequality** s o loo a r a s o a l s a s r s o o a or s. a l 1 -1 s o s a 11. r o all a l s a a al or - a o s o l ss a $20,000 1 , l 2 . r a a al o s o $,000 or or . a a a l s s o s ra l al y o a ly o a a a.

TABLE 17-1 THE DISTRIBUTION OF PERSONAL INCOME BY FAMILIES, 1997

PANEL (A)

Personal income category	Percentage of all families in this category
under $10,000	2.5
$10,001 to $14,999	3.7
$15,000 to $19,999	5.1
$20,000 to $29,999	13.0
$30,000 to $49,999	25.2
$50,000 to $74,999	25.9
$75,000 and over	24.6
	100.0

PANEL (B)

Average 1997 income for families	$57,146
Median 1997 income for families	$50,361
Number of families in Canada	8,394,000

Source: a s s a a a, *Income Di ib ion b Si e in Canada, 1997* (a a, r 1), a l 1, a . o. 1 -20 .

Distribution of Personal Income by Quintiles (Fifths)

s o ay o as r o al y s o o al r o o r rs o r ally al ro s, or *in ile* , a a r a o o al rso al (or - a) o r y a l . o s a l 1 -2.

The Lorenz Curve

a s lay l s r o o rso al o ro a **Lorenz curve**. r 1 -1, lo la r a o a l s o or o al a s a r a o o y o a o r al a s. a o al l 0e r r s s a *e fec l e al di ib ion of income* a s a o alo a l a s a a ar lar r a o a l s r sa r a o o . o r or s, o s r r s 20 r o all a l s r 20 r o o al o , 0 r r 0 r , 0 r r 0 r , a so o , all l o a o all . y lo l a a ro a l 1 -2, o a or r or 1 . s r

TABLE 17-2 PERCENTAGE OF TOTAL BEFORE-TAX AND AFTER-TAX INCOME RECEIVED BY EACH QUINTILE GROUP

	BEFORE TAX			AFTER TAX
Quintile	1951	1965	1997	1997
Lowest 20%	4.4	4.4	4.6	5.5
Second 20%	11.2	11.8	10.0	11.3
Third 20%	18.3	18.2	16.4	17.2
Fourth 20%	23.3	24.5	24.8	24.6
Highest 20%	42.8	41.1	44.2	41.4
	100.0	100.0	100.0	100.0

o r a s s a a a, *Income Di ib ion : Income of Non-Fa m Familie and Indi id al in Canada, 1951 1965* (a a, 1) a *Income Af e Ta e , Di ib ion b Si e in Canada, 1996, 1997* (a a, 1 a 1), a . o. 1 -210.

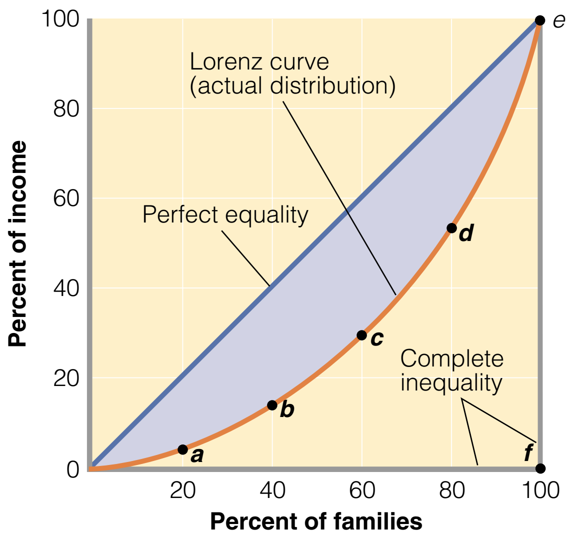
ro o *a* a o o 20 r o all a l s r . r o o o o 0 r r 1 . r (. + 11.), as s o y o *b* a so or . l ar a a o al l a or r s r y a or r sa s a ay ro a o al a a s r o o al y. a al o s r o r r ly al, or r a a o al o l o a l ar a o l sa ar.

o os r s a s a o o o - l al y, r all a l s o a ro o . a as or r o l o or o al a s ro 0 o o *f* (a 0 r o o) a o l o a ly ro *f* o o *e* alo r al a s (a a a s l a ly as 100 r o o al o). r ar a lo a o al l (ar a 0*ef*) o l a s r r o al-y. o ral , ar r or r sa s a ay ro a o al, r a r s r o o al y.

or r a also lo o o ras o s r o o r ro s, r a ro s, a r o r s. (***Key Question* 2**)

FIGURE 17-1

The Lorenz curve is a graph of the percentage of total income obtained by cumulative percentages of families. It is a convenient means of displaying the degree of income inequality. Specifically, the area between the diagonal (the line of perfect equality) and the Lorenz curve represents the degree of inequality in the Canadian distribution of total income.



Income Mobility: The Time Dimension

o a a a a s so ar a a a orl a o o
a o ro o o y ar s oo s or o ry a l. a s a-
s s a a a a a or ray s r o o o o ly a s l y ar, y ay
o al a or al s r o o r a y ars, a a , or a l .
s a ar s $1000 y ar o a $100,000 y ar o, l a l ar s
$100,000 y ar o a o ly $1000 y ar o, o a o al y
a s r s o r o o as r . al a a o l r al r a
o al y, r o l o l al y o r o-y ar r o .
s o s or a a s s s s o s ra l ar a o
s r o o o o r . or os o r rs, o s ar s a a r l-
a ly lo l l, r a s a a r l a , a l s. ollo s
a all o l r a ly sa s r a o o o r r l s, o-
s ra l o al y o l s ll s a y s y ar a s o a
r s. a y s l y ar, yo a ol o l r lo o s,
l l -a r o s.

a ro a s a s o o o s r o a s l y ar o a
os r or ray o s o r lo r r o s, o s -
ra l o o o r rs a o o lass s. s o or-
r ly s s s a o s or ally s r o r a -y ar, 10-y ar, or
20-y ar r o a a s l y ar. o o als or a l s ro
o o l o a o r o r s all **income mobility**.
s or , r s s a al a a ly o o l y o r or
a y o l , lo o a o ar o r a o o s.
lo r r o o s r , or al s r o o o o s.

INCOME MOBILITY The movement of individuals and families from one income quintile to another over time.

Effect of Government Redistribution

o a a a l s 1 -1 a 1 -2 l a s, salar s, s, a
r s . y also l all as ra s r ay s s as, loy s r-
a s a l ar ass s a o y a l s. a a ar or - a a a
a r or o o a o a o s o rso al o a a a a
s o la o r o s a ar l r ly o o r rs. or o y
l - or **noncash transfers**, ro s oo s or s r s
ra r a as . o as ra s rs l s s as o s s s s, -
al ar , a r la s. ra s rs ar o l , s y a l
r s o r as oo s a s r s.

o o o o o r s o r s r o , so y so
s r s. a l 1 -2 r als a o r r s r s o ro r- o
lo r- o o s ol s ro a s a ra s rs. s o s a y a
a a a a s r o o o s ol o or a s a ra s rs ar
a o a o s l ss al a s r o a r a s a ra s rs. -
o o r r s r o , lo s 20 r o o s ol s 1 o l
a r o ly . r o o al o . r s r o , y r .
r , 2 r or .

o r s or o r s r o , o r a s or o r
ra s rs a s r s ra s rs. o ly 0 r o r o o
al y s a r a l o ra s r ay s, a o or or a r-
o o o lo s l . o r ro o o o or -
s, ra s r ay s a os or a a s o all a o r y
a a a.

NONCASH TRANSFER Government transfer payments in the form of goods and services rather than money.

<www.jewishworldreview.com/cols/williams071699.asp>
The Vanishing Poor

CAUSES OF INCOME INEQUALITY

r ar s ral a s s o o al y a a a. ral, ar sys- s a rso al a s a o s o o s o r a s a a l or s s r o o o . s r ss o a r o o al y a s r ar s als as o o r o a r r so r s a o ro so y's o . a ors a o r o o al y ollo .

Ability

o l a r al, ys al, a a s al s. o a r o al al al s a ar ss al o s - ay o a o s as , or ora l a rs , a la . rs ar l ss ys al a a y a oor a o o o ly a ro ss o al a l s. a al o o r a ar s s or s a s or a a y o o o as o o ls. rs a ry a al o s a ay or lo - ay o a o s or ay o a l o ar a y o a all. ll a s lls o os o l all so r - .

Education and Training

l y alo rar ly ro s o o l s lo a r r a a l s ro a o a ra . als r s a ly a o o a o a ra y o a a s r a a y o ar o . r s ay a a r o o rs la o r or a r ra a ro s ool, l o r a s a o o ly a r ar a rs y r . r r s ay ol ary a r ar s ay s ly a l o a a os s o ary a o .

o l also r ary r s o o - - o ra , o r s o o al y. o or rs l ar al a l s lls a y ar o o a , r or , r s a o ro o r o rs r l l or o o - - o ra a ar o or a a 0 a y a a 0. or o r, r s o s l or a a o - - o ra os or rs o a s l l o or al a o . a a ra a s a o - as o r s l ss- a a r- a als.

Discrimination

s r a o a o , r , ra , a ro o o o ly o - r s o o al y a a a, al o r s r a . s- r a o r s r s or s or o o lo - ay o a o s, s ly o la o r ll r a r la o a os o a o s. a s a o s ll r a lo . o rs ly, s r a o r s o o a s or a o a o s y ar r o a . s, la o r s ly s ar ally l r la o a os o a o s, r s l a a s a o s ar .

Preferences and Risks

o s also r a s o r s r r s or ar or r la o l s r , ar or r la o or o s ol , a y s o ar or .

o l o oos o s ay o l r , or ar , or r r arly s ally a l ss o a o l o a o r o s. or a l , os o ar ll o a ar o s, l asa o s, s as r ro or a y o s r o , o or lo o rs r a s y, or o oo l ll o ar or .

als also r r ll ss o ass r s . r r r o o ly o ra ar r r or ro ss o al o r also o r r r. l o a y r r rs a l, a y o os o lo s ss l ro s or s r s r al ry s s a al o s. a o r s o o al y.

Unequal Distribution of Wealth

o s a *o* r r s s a s r a o a a salary ar s, alo r , r s , a ro s, as a r 2's r lar o a ra . o ras , al s a *ock*, r a a ar lar o a al a r al ass s a al as a la o r . r r rso ay a ry l l o a y o a o , al s ar s, a a s o la a a o o s ra l al . rs y ra a ay ar a s s a al o as a a o a , l a a r, or r a y o a la s a al .

o rs o al a a a s or al a s r o o o . s al y o al l a s o al y r , r s , a s, r o r s o o al y. os o o or a ry, r al s a , ar la , s o s a o s, a sa s a o s o o sly r r a r o ro a o rs a o l l ss or o s al .

Market Power

a l y o r ar o yo r o al also o r s o o al y. or a l , *e o ce* ar s r a o s a ro ss o al ro s a a o ol s a l s ly o r s r s, r y oos o s o os o s . lso, l sla o a r r s o a o al l s or, say, o ors, s s, a la y rs a s o ar o r a a o rs l s ro s. *od c* ar s, r ar a s a or a o o oly o r, r s l s r a r ro a s r a r o o r s' o rs.

Luck, Connections, and Misfortune

r or s also lay a rol ro o al y. a r la a r a l als o s l o or s. s o r o l o a ra , o la alo a ro os ay r a , a r r r ss a a a o or so o s. rso al o a s a ol al o o s ar o r o al ro s o a a o .

o ras , o o s or s s as rolo ll ss, s r o s a , a o a ly r a r, or loy ay l a a ly o lo ra o o . r o s s or s or ry ly y o la o a s o r s o o al y. (***Key Question 4***)

QUICK REVIEW

- Data reveal considerable income inequality in Canada; in 1997 the richest fifth of all families receive 41.4 percent of after-tax income, and the poorest fifth receives 5.5 percent.
- The Lorenz curve depicts income inequality graphically by comparing percentages of total families and percentages of total income.
- The distribution of income is less unequal over longer periods.
- Government taxes and transfers significantly reduce income inequality by redistributing income from higher-income groups to lower-income groups; the bulk of this redistribution results from transfer payments.
- Differences in ability, education and training, tastes for market work versus nonmarket activities, property ownership, and market power—along with discrimination and luck—help explain income inequality.

TRENDS IN INCOME INEQUALITY

<www.ccsd.ca/perception/insite7.htm> Who benefits from Canada's income security programs?

r a r o o y ars o o ro as ra s o s a a a *ab ol e* ollar a o s, r s r o o o as o ar . o s ay o *ab ol e* r s l l a *ela i e* s r o o o l ss al, or a . a l 1 -2 s o s r la s r o o r-so al o o r . all a rso al o s or a a l s as ra s rs o o as ra s rs. s yo a s , s r o o o a a a as r a r ar a ly o s a o r as 0 y ars. Glo al rs 1 .1 o ar s al y a a a (r y als, o y a l s) a s ral o r a o s. o al y s o - s lo a o s.

Causes of Growing Inequality

o o s s s s s ral a or la a o s or r s o o al y o as r a s.

GREATER DEMAND FOR HIGHLY SKILLED WORKERS

r a s os s a o r or o ro o al y as a r as a y a y r s or or rs o ar ly s ll a ll a . ral s r s r r ly s ll or rs a r r ly r or a r a ly, s as o r so ar , s ss o s l , o olo y, al ar , a r s r s. a s ly s ll or rs r a r la ly s ar , r a s a . o s ly, a - r s a l ss-s ll or rs a r as . r s a or s ll as also s l ra ly r s ay or s (o rs), s a l r as s o ro s o o o s, s - s a al r as s o s o ro ss o al a l s a r a rs, a or- s or s ss l r r rs. s ro o s rs ar ay as also o r o r s o al y.

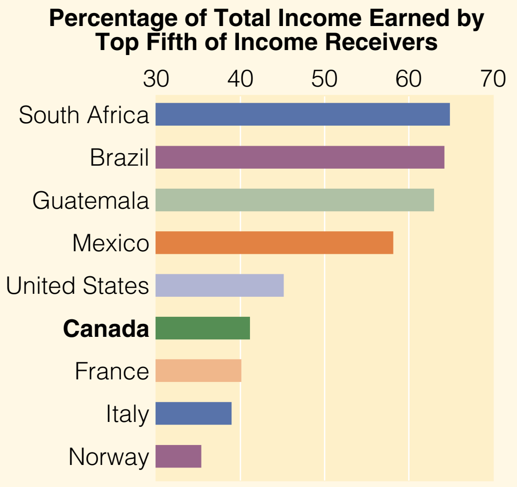
DEMOGRAPHIC CHANGES

ra o lar rs o l ss- r a l ss-s ll a y oo rs o la o r or r 1 0s a 1 0s ay a o r o r a r

GLOBAL PERSPECTIVE 17.1

Percentage of total income received by top one-fifth of income receivers, selected nations

The share of income going to the highest 20 percent of income receivers varies among nations. Frequently, income is less equally shared in poor nations than in rich ones.



Source: *World Development Report, 2000*, pp. 238–239.

o al y os o a s. a s yo r or rs o ar l ss
o a ol r or rs, r ro rs o r o o al-
y. r as also a ro y or a o ar s
o al o arry a o r, s r as a ly o a o s -
o l s. ally, r o a l s a y s l or or
o as r as r a ly. a r as r as o al y a s
s a l s la a s o a or a ar r, a also a s o r y ra or
al - a o s ol s s ry .

INTERNATIONAL TRADE, IMMIGRATION, AND DECLINE IN UNIONISM

r a ors ar l ly a or . ro r r a o al o o ro or s
as r a or a loy o l ss-s ll (ly a)
or rs s s r s as a o o l a s l s r s. l
s o s as r a ra a or l ss-s ll or rs. also as s ll
ra s o or rs alr a y lo - ay s r s, la r r o ar
r ss r o a s r . larly, ra s r o o s o lo r- a or rs
lo o r s r s o ar a r ss r o l ss-s ll or rs
a a a. lso, a s r ra o o s ll or rs r as s -
r o lo - o a l s a a a. ally, l o s a a a
o ly o r s o a al y, s o s o al ay
r s a s r s.

o a o s ar or r rs , o ro o al y, ar
o say a r ar r r a oor ar oor r r s
o a sol o . o r a oor ar r r s s r al o .
a r, a as a s a , l o s a r s all l s, o
ro as as s o l . o , r as o al y s o
sol ly a a a a o o . r o o ar r a r al y as also
o rr s ral o r s r ally a a a o s.

EQUALITY VERSUS EFFICIENCY

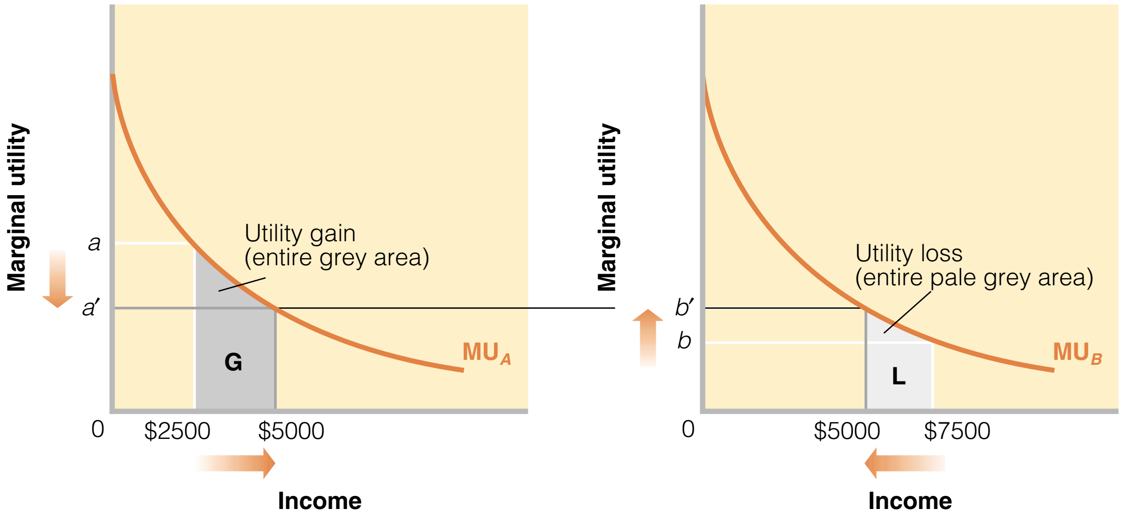
a ol y ss o r o al y s o s ssary a
s . l o ral a r s s o s a l a o , a a
s y lor as s or a a a s r a r al y.

The Case for Equality: Maximizing Total Utility

as ar or a al s r o o o s a o al y a -
s o al o s r sa s a o (l y) ro a y ar lar l l o o
a o . ra o al or s ar s s o r 1 -2,
ass a o y o s o o als, rso a roo s, ar s -
o s ar al l y. a y r o , o r rs s rs
ollars r o ro s y al os ro s os ar al l y
s . s r os r ss a s o sa s , o s rs s a -
o al ollars o o o l ss or a , lo r- ar al- l y oo s. -
al s - ar al- l y- ro - o r s ($_A$ a $_B$ r)
r ass o a rso a roo s a sa a a y o r
l y ro o .

o s os $10,000 or o o (o) s o s r
rso a roo s. or o ro o s o o al y, o al s-
r o s a al s r o , a s s ar al l y o las ol-
lar s o sa or o rso s. a ro s y o s ra a
o s r o s ally al, s r o or ally
a r as o l y o o als.

FIGURE 17-2



With identical marginal-utility-of-income curves MU$_A$ and MU$_B$, Anderson and Brooks will maximize their combined utility when any amount of income (say, $10,000) is equally distributed. If income is unequally distributed (say, $2500 to Anderson and $7500 to Brooks), the marginal utility derived from the last dollar will be greater for Anderson than for Brooks, and a redistribution toward equality will result in a net increase in total utility. The utility gained by equalizing income at $5000 each, shown by the full area *G* below curve MU$_A$ in panel (a), exceeds the utility lost, indicated by the full area *L* below curve MU$_B$ in panel (b).

os a $10,000 o o ally s s r ally, r-so $2 00 a roo s $ 00. ar al l y, *a*, ro las ollar r y rso s , a ar al l y, *b*, ro roo s's las ollar o o s lo . a s l ollar o o s s ro roo s o rso a s, o ar r a r al y rso 's l y r as s y a a roo s's l y r as s y *b*. o l y r as s y *a* s *b* (rso 's lar a s roo s's s all loss). ra s r o a o r ollar ro roo s o rso a a r as s r o l y, s y a sl ly s all r a o . o ra s r o ollars ro roo s o rso r as s r o l y l o s ly s r a o r $ 000. a r ar al l s ro las ollar o o ar al a (*a'* a *b'*), a a y r r o r s r o yo $2 00 alr a y ra s rr o l o r a al y a r as r o l y.

ar a r r , a o l o al's ar lar l l o o , r r s s o al l y o a o . r or , as a r s l o ra s r o $2 00, rso as a l y r r s y ll ar a *G* lo r *A*, a roo s as los l y r r s y ll ar a *L* lo r *B*. r a *G* s o o sly r a r a ar a *L*, so o al y y l s r a r o o al l y a o al y o s.

The Case for Inequality: Incentives and Efficiency

The Influence of Incentives

l o lo o ar or al y s so , r s a a s a-al ass o a r s so a o o o ro a r - or o o s r . r s o o al y ar *ha he a in hich income i di ib ed i an im o an de e minan of he amo n of o o income ha i od ced and i a ailable fo di ib ion.*

os o a a r 1 -2 a rso ar s $2 00 a roo s ar s $ 00. o o ar al y, so y (o r) s a a ay so o roo s's o a ra s r o rso . s a -a - ra s r ro ss - s s o r ar s o - o roo s a ra s s o r ar s o lo - o rso so o , r s s o o o ar o s. y s o l - o roo s or ar , sa , s , or r a r r r al r s s r ar s ro s a s ll r y a - a o y s o l lo - o rso o a o r as s o ro ar a s o r s a s r a y o ra s r o o a s ar a r o r ar s ro r as ro or r s- r o ro ra s rs s a r ar or s or .

r , a as a o o r l s a 100 r a o o a s r s a r ally o s ry. y o l a yo or ar y o l a yo or a all y o l a yo ass s ss r s r y o l a yo sa (or o rr o s o) or r o s o o s o a a o l r o , r a ly r so y's o al ro o a o . o r or s, ay o s s- r a s s o a . as ar or o al y s a al y s ss al o a a s o ro o a o a s, o a y ar a r y ar.

TRADEOFF BETWEEN EQUALITY AND EFFICIENCY The decrease in economic efficiency that may accompany a decrease in income inequality.

The Equality–Efficiency Tradeoff

ss o s o al y al y a s a r s a a - al **tradeoff between equality and efficiency**. ro l or a so y a s l o ar al y s o r s r o a ay a s a rs so o o y. o s r s l a y- a alo y ss a so y a r s o s o ro r o oor, o y s arr ro a o al a y . l a r r s s a y loss loss o o a o a s y ar l so r s r- o o s o or , o sa a s , a o a r r r al r s . s l a also r s a a r so r s s r o r a ra s a a s r r s r o sys . o l a a ll so y a l o o a r o r s r- o o o or al sl s s r s , a a o o s r a ll so y ol ra s a loss o o o a r s r ollar a a l s 2 s 0 s s s as s o a y a o r al s o a a o ’s o - a a ro ra s.

THE ECONOMICS OF POVERTY

r ro lar r ss o o s r o o or s ss o ry lo o , or o r y. so y a r o o al y a a r a , o ra , or lo a o o o r y. o l ar a o o o r y a a a, ara r s s o oor, a ro ra s s o r o r y.

Definition of Poverty

ABSOLUTE POVERTY A situation in which the basic material needs of an individual or a family (food, clothing, shelter) are not met.

RELATIVE POVERTY A situation in which an individual’s or a family’s income is low relative to others in society.

o r y o s o l s l o r s o , l s o s s a sol a r la o r y. **Absolute poverty** o rs as a r al s oo , lo , a s l r o a al or a a ly ar o . **Relative poverty** r rs o a al’s or a a ly’s lo o r la o o rs so y. l a a ly’s as a r al s ay , o l s ll o s - r oor s o r la o o rs s lo r.

l s oss l o ra a a sol o r y, r la o r y ll ro a ly al ays aro , a l as a ar o o y, r so als ar a l o ar or a o rs.

a ly’s s a a y r a s ss , s al , a s o s rs, a so or . s a s l rr ly ar o , ra s r ay- s, as sa s, ro r y o , a so o . a s s a a a s s a (r s 1 2) lo o -o a l s a s . r or or o r o o oo , s l r, a lo ar o s r o lo -o . 1 , 1 .0 r o a l s a . r o a a als r o s r o l o r y a a a.

<www.napo-onap.ca/nf-figur2.htm> Facts and figures about poverty in Canada

Who Are the Poor?

or a ly or r os s o l ol y, oor ar ro o s y a o all o ra r o s y ar s, o - s, a a o l s y l lar rs o o r ral a r a o l y ar o ol a yo .

, s s r as ss, o r y s ar ro ra o ly s r , as a l 1 - o s ra s. a o o r y ars o s ool l a la o a r ro s a or y r o r r-1 l r s ll a o ll, s s l ly o oor. r l r a l o a

TABLE 17-3 INCIDENCE OF LOW INCOME BY SELECTED CHARACTERISTICS, 1997

		ESTIMATED PERCENTAGE BELOW LOW INCOME CUT-OFF*	
		Families	Unattached Individuals
All families and unattached individuals		14.0	39.6
By region:	Atlantic provinces	14.8	41.6
	Quebec	16.4	47.4
By age of household head:	24 years and over	42.8	60.7
	25 to 34 years	18.7	30.9
	65 and over	6.8	45.0
By sex of household head—female		40.2	44.3
By marital status of household head: neither married nor single†		29.0	40.6
By weeks worked:	none	28.1	57.6
	1 to 9 weeks	43.7	85.2
	10 to 19 weeks	33.4	71.1
	20 to 29 weeks	27.6	52.2
	30 to 39 weeks	20.3	44.0
	40 to 48 weeks	14.4	37.1
	49 to 52 weeks	5.9	17.2
By education of household head:	0 to 8 years of school	18.4	58.7
	some secondary	19.0	48.8
By origin of household head:	Canadian born	12.4	38.5
	non-Canadian born	19.9	45.2
By number of children under 16 years:	none	9.7	39.6
	1	19.5	—
	2	18.0	—
	3 or more	24.9	—

Source: a s s a a a, *Income Di ib ion b Si e in Canada, 1997* (a a, 1), a l .

* s o a 2 o so r , a l s a s . r or or o r o o oo , s l r, a lo r o - s r o s ra r s a s a , r or , lo 1 2 . or o s r ro , s s a a .2 l- lo o l r lo 1 , r r s s 1 . r o o r o la o (o o 1, ,000 r l r).

or , s ara , or o .

s s o r 0, r or s loo o r r. s ro orr la o s o a l 1 - or s y ar a oor s . o r, o a . r o a l s a 1 .2 r o a a als o or o 2 s r s ll oor.

o r y ra or l r s s ally s r a s o r y s o r o r y. oor l r ar a r a r r s or a ra o lo - r ro l s, l oor al a a a a o , r , r s, a a r - a y. a y o o ay's o r s ll r a a l oo al y, ll ra , a a l o ar a o - o r y o s.

ro o r s ss o o o o l y, o a r s o s ra l o o o o r y. ly sl ly or a al o os o ar o r y

CANADA PENSION PLAN (CPP) A national retirement plan funded by obligatory employer and employee contributions.

OLD AGE SECURITY (OAS) A pension paid on application at age 65 to everyone resident in Canada for at least 10 years immediately before turning 65.

<www.statcan.ca/Daily/English/000306/d000306a.htm>
Poverty and the elderly

o y ar ll r a lo o r y l y ar. o r, o r y s or rs s or so ro s, ar lar a l s a y o , os l l a o a la o r ar s lls, a os o ar ys- o al a s o r s, al o ol s , or al ll ss.

The Invisible Poor

a s a r s o a ara r o o r y ay l o a . r all, o rs s a a so y. o o r o l r ss s a- s s o o r y ry ay o s r a o s o a a a s r l s a ly a a a a a o r y s s lar ly s l . r ar r r aso s or s s l y. rs , as a l ro or o o o l o r y ool a ro y ar o y ar. s ar as s o a as a y as o - al o os o r y ar oor or o ly o or o y ars or s ss lly l o o o r y. a y o s o l ar o s l as r a ly o - ro a y. o , r a ly oor ar r as ly sola o- ra ally. o r y rs s s r ss ar as o lar s a s o r a ly s l ro r ss ay or o r ra . larly, r ral o r y a ro ally r ss ar as o as r a la ro s ar also o a a . r , a r a s os or a , oor ar ol ally s l . y o o o a r s ro s ar o s l ls o o r s or r r s.

THE INCOME MAINTENANCE SYSTEM

TABLE 17-4 ESTIMATED FEDERAL GOVERNMENT TRANSFER PAYMENTS, 2001–2002

Program	Estimated expenditures*, millions of dollars
Major transfers to other levels of government	
Fiscal Equalization	10,479
Canada Health ad Social Transfers	17,300
Territorial governments	1,539
Alternative payments for standing programs	(2,400)
Other	(500)
Subtotal	26,458
Major transfers to persons	
Elderly Benefits	25,181
Employment Insurance	12,247
Subtotal	37,428
Other transfer payments and subsidies	18,996
Total transfer payments	**82,882**

Source: r as ry oar r ar a *2001 2002 E ima e , Pa I: The Go e nmen E endi e Plan and Pa II: The Main E ima e* (a a ly a r s a a a, 2001), . s-s . . a/ / s a / s . l . ro r ss o o s ro l or s a Go r r s a a a, 2001.

* s al y ar ar 1, 2002
s . ra ll. a/ oll / o ll or a a a .

The Role of Governments

s o a ar- y o o - a a ro ra s s a all a o o o r y as a as a l a oal o l ol y. r y ars, o - a a ro ra s a ol s s a al o ary o lays a lar rs o ar s. o o - al o ral o r 's 2001 02 r s ll ra s r ay- s. o r s a s s $ l- l o o r s ll s rs as s o a l 1 - . s o l o , o r, a l o s ra s rs o o o - oor, a o ly a o s ro ra s ar s - ally ar a oor.

a o o all s ro ra s, r s **Canada Pension Plan (CPP)** y o l - a ory loy a loy r o r o s.[1] r as s a y ar y r a r as os o l r o s y ar.

Old Age Security (OAS) s o s a o a l a o a a o ryo r s a a a or a l as 10 y ars a ly or

---

[1] The Quebec Pension Plan, for residents of that province, is similar.

GUARANTEED INCOME SUPPLEMENT (GIS) Money paid on application, subject to a means test, to those receiving an OAS pension who have an income below a certain level.

r . **Guaranteed Income Supplement (GIS)** s a o a l a o , s - o a a s s , o os r s o o a a o lo a r a l l. o s ra ly or a al o a a a s o r ra G . o s o a G ar r as ry r o s y r- a r as os o l r o s r o s.

EMPLOYMENT INSURANCE (EI) A program that insures workers against the hazards of losing their jobs.

Employment insurance (EI) as s ar 1 0 o s r or rs a a s a ar s o los r o s. r a ly as l ss s ry o ry lar r o ol ar ly loy r r ss o ary r o s. arly 1 0s, loy s ra s r r a ly r as so a os - as r a or ar al or rs o r la o r or , o o or , o al y or s. 1 , s r r as sl ly l al y or as a or l . y arly 1 0s ral o r a - r l s o al y or , as o o s. y -2000 r o rso s r a all s a ly, ar ly as a r s l o a al y o o y.

QUICK REVIEW

- The fundamental argument for income equality is that it maximizes total utility by equalizing the marginal utility of the last dollar of income received by all people.
- The basic argument for income inequality is that it is necessary as an economic incentive for production.
- By government standards, more than five million Canadians, or 17.5 percent of the population, live in poverty.
- The Canadian income maintenance system includes both social insurance programs and public assistance (welfare) programs.

WELFARE: GOALS AND CONFLICTS

KEY CONCEPTS Facing Tradeoffs

al l ass s a (l ar) ro ra s o l s l a o sly a r oals. rs , la s o l als a a l s o o o r y. o , s o l ro a a s or a l - o , o r r o l o or . r , la ’s os s o l r aso a l . or a ly, s r oals o , a s ra o s a ss a o ro s s. o r- s a s, o s r r y o al l ar la s s o a l 1 - .

Common Features

rs a o o o l s a o r la s (a r al- orl l ass s a la s). rs , r s a *minim m ann al income* a o r - ll ro a ly as o ar o . o , a la as a *bene - ed c ion a e,* s ra a s ar r or los as a r s l o ar o .

o s r la 1. a al o ro y o r s $,000, a -r o ra s 0 r . a a ly ar s o o , ll r as ra s r ay s o all $,000. ar s $,000, ll los $2,000 ($,000 o ar s s 0 r -r o ra) o ra s r ay s s o al o ll $10,000 ($,000 o ar s *l* $,000 o ra s r ay s). $,000 s ar , ra s r ay s ll all o $,000, a so o . o a a a

TABLE 17-5 TRADEOFFS AMONG GOALS: THREE PUBLIC ASSISTANCE PLANS

Plan 1 ($8,000 minimum income and 50% benefit-reduction rate)			Plan 2 ($8,000 minimum income and 25% benefit-reduction rate)			Plan 3 ($12,000 minimum income and 50% benefit-reduction rate)		
Earned income	Transfer payment	Total income	Earned income	Transfer payment	Total income	Earned income	Transfer payment	Total income
$ 0	$8,000	$ 8,000	$ 0	$8,000	$ 8,000	$ 0	$12,000	$12,000
4,000	6,000	10,000	8,000	6,000	14,000	8,000	8,000	16,000
8,000	4,000	12,000	16,000	4,000	20,000	16,000	4,000	20,000
12,000	2,000	14,000	24,000	2,000	26,000	24,000*	12,000	24,000
16,000*	0	16,000	32,000*	0	32,000			

* a s r a - o . r y o y -r o ra .

o o $1 ,000, ra s r ay s ar ro. l l o ar o a ra s r ay s sa ar s all *b eak-e en income.* r la 1 o ro s a a 0 r -r o ra s oo a r or o s o ro s s o or . s ar o r as s, loss o ra s r ay s o s s a a o ar s. o o l ay oos o o or y los 0 s o a ra ollar ar . s la 2 $,000 o s r a , -r o ra s r o 2 r . o a r a - l l o o r as s o $ 2,000, so a y or a l s o l o al y or ra s r ay s. r- r or , a a ly a y ar o r $ 2,000 ll r a lar r o al ra s r ay . or o r aso s, a r o o loss ra o a or s ll ra s os o o - a a la .

r a la s 1 a 2, ar a $,000 a al o s oo lo o s o a l s o o o r y. la ra s s - o o $12,000 a r a s 0 r -r o ra o la 1. l la o s a r o o ra s o s o oor, oo y l s a r r a - o a la 1 a r or ll or os ly. lso, $12,000 o ara o la r o l la 2's 2 r - r o ra o s r or s, r a - o l l o l s oo o $,000 a a or o os s o l ass s a ro ra .

<www.un.org/esa/socdev/poverty.htm> UN declares 1997–2006 the Decade for the Eradication of Poverty

Conflicts among Goals

l arly, oals o l a o r y, a a or s, a ol o ro ra os s ar o .

la 1, a lo o a a -r o ra , s os o . lo o a s a s la s o ry l a o r y, a -r o ra a s or s. o ar so , la 2 as a lo r -r o ra a r or s ro r or s. s or os ly a s s s a r r a - o a r or ays s o or a l s.

o ar la 1, la as a r o a s or - l a o r y. l or s ar sa as os la 1, r ara o la a s la or os ly. (***Key Question 9***)

The LAST word

POVERTY IN THE VOICES OF POOR PEOPLE

While statistics tell us much about poverty and inequality, the statements below attest to the human suffering caused by insufficient material means in many nations.

Poor people in 60 countries were asked to analyze and share their ideas of well-being (a good experience of life) and "ill-being" (a bad experience of life).

Well-being was variously described as happiness, harmony, peace, freedom from anxiety, and peace of mind. In Russia people say, "Well-being is a life free from daily worries about lack of money." In Bangladesh, "to have a life free from anxiety." In Brazil, "not having to go through so many rough spots."

People describe ill-being as lack of material things, as bad experiences, and as bad feelings about oneself. A group of young men in Jamaica ranks lack of self-confidence as the second biggest impact of poverty: "Poverty means we don't believe in [ourselves], we hardly travel out of the community—so frustrated, just locked up in a house all day."

Universal Problems

Although the nature of ill-being and poverty varies among locations and people—something that policy responses must take into account—there is a striking commonality across countries. Not surprising, material well-being turns out to be very important. Lack of food, shelter, and clothing is mentioned everywhere as critical. In Kenya a man says: "Don't ask me what poverty is because you have met it outside my house. Look at the house and count the number of holes. Look at my utensils and the clothes I am wearing. Look at everything and write what you see. What you see is poverty."

Alongside the material, physical well-being features prominently in the characterizations of poverty. And the two meld together when lack of food leads to ill health—or when ill health leads to an inability to earn income. People speak about the importance of looking well fed. In Ethiopia poor people say, "We are skinny," "We are deprived and pale," and speak of life that "makes you older than your age."

More Than Material Goods

Security of income is also closely tied to health. But insecurity extends beyond ill health. Crime and violence are often mentioned by poor people. In Ethiopia women say, "We live hour to hour," worrying about whether it will rain. An Argentine says, "You have work, and you are fine. If not, you starve. That's how it is." Two social aspects of ill-being and poverty also emerged. For many poor people, well-being means the freedom of choice and action and the power to control one's life. A young woman in Jamaica says that poverty is "like living in jail, living in bondage, waiting to be free."

Linked to these feelings are definitions of well-being as social well-being and comments on the stigma of poverty. As an old woman in Bulgaria says, "to be well means to see your grandchildren happy and well dressed and to know that your children have settled down; to be able to give them food and money whenever they come to see you, and not to ask them for help and money." A Somali proverb captures the other side: "Prolonged sickness and persistent poverty cause people to hate you."

Source: *World Development Report 2000–2001*, "Introduction,"(Oxford University Press, New York, 2000), <www.worldbank.org/poverty/wdrpoverty/report/ch1.pdf>.

CHAPTER SUMMARY

1. The distribution of income in Canada reflects considerable inequality. After taxes, the top 20 percent of families earn 41.4 percent of total income, while the bottom 20 percent earn only 5.5 percent.
2. The Lorenz curve shows the percentage of total income received by each percentage of families. The extent of the gap between the Lorenz curve and a line of total equality illustrates the degree of income inequality.
3. Recognizing that the positions of individual families in the distribution of income change over time and incorporating the effects of noncash transfers and taxes would reveal less income inequality than do standard census data. Government transfers (cash and noncash) greatly lessen the degree of income inequality; taxes also reduce inequality but not nearly as much as transfers.
4. Absolute poverty occurs when the basic material needs are not met. Relative poverty refers to an individual's or a family's low income relative to the rest of society. Absolute poverty can be eradicated, but relative poverty is much more difficult to resolve.
5. Causes of income inequality include differences in abilities, education and training, and job tastes, along with discrimination, inequality in the distribution of wealth, and an unequal distribution of market power.
6. The basic argument for income equality is that it maximizes consumer satisfaction (total utility) from a particular level of total income. The main argument for income inequality is that it provides the incentives to work, invest, and assume risk; it is necessary for the production of output that, in turn, creates income that is then available for distribution.
7. Current statistics suggest that about 17.5 percent of the country lives in poverty. Poverty is concentrated among the poorly educated, the aged, and families headed by women.
8. Our present income maintenance system is made up of social insurance programs (Canada Pension Plan and employment insurance benefits), universal programs (Old Age Security Pension), and public assistance or welfare programs.
9. Public assistance programs (welfare) are difficult to design because their goals of reducing property, maintaining work incentives, and holding down program costs often conflict.

TERMS AND CONCEPTS

income inequality, p. 438
Lorenz curve, p. 438
income mobility, p. 440
noncash transfers, p. 440
tradeoff between equality and efficiency, p. 446
absolute poverty, p. 447
relative poverty, p. 447
Canada Pension Plan (CPP), p. 449
Old Age Security (OAS), p. 449
Guaranteed Income Supplement (GIS), p. 450
employment insurance, p. 450

STUDY QUESTIONS

1. Using quintiles, briefly summarize the degree of income inequality in Canada.
2. KEY QESTION Assume Syed, Beth, Sabine, David, and Mikkel receive incomes of $500, $250, $125, $75, and $50 respectively. Construct and interpret a Lorenz curve for this five-person economy. What percentage of total income is received by the richest quintile and by the poorest quintile?
3. Why is the lifetime distribution of income more equal than the distribution in any specific year?
4. KEY QUESTION Briefly discuss the major causes of income inequality. With respect to income inequality, is there any difference between inheriting property and inheriting a high IQ? Explain.
5. Use the leaky-bucket analogy to discuss the equality–efficiency tradeoff.
6. Should a nation's income be distributed to its members according to their contributions to the production of that total income or according to the members' needs? Should society attempt to equalize income or

economic opportunities? Are the issues of equity and equality in the distribution of income synonymous? To what degree, if any, is income inequality equitable?

7. Analyze in detail: "There need be no tradeoff between equality and efficiency. An efficient economy that yields an income distribution many regard as unfair may cause those with meagre income rewards to become discouraged and stop trying. Hence, efficiency is undermined. A fairer distribution of rewards may generate a higher average productive effort on the part of the population, thereby enhancing efficiency. If people think they are playing a fair economic game and this belief causes them to try harder, an economy with an equitable income distribution may be efficient as well."

8. Comment on or explain:
   - **a.** "To endow everyone with equal income will certainly make for very unequal enjoyment and satisfaction."
   - **b.** "Equality is a superior good: the richer we become, the more of it we can afford."
   - **c.** "The mob goes in search of bread, and the means it employs is generally to wreck the bakeries."
   - **d.** "Some freedoms may be more important in the long run than freedom from want on the part of every individual."
   - **e.** "Capitalism and democracy are really a most improbable mixture. Maybe that is why they need each other—to put some rationality into equality and some humanity into efficiency."
   - **f.** "The incentives created by the attempt to bring about a more equal distribution of income are in conflict with the incentives needed to generate increased income."

9. **KEY QUESTION** The following table contains three hypothetical public assistance plans.
   - **a.** Determine the minimum income, the benefit-reduction rate, and the break-even income for each plan.
   - **b.** Which plan is the most costly? the least costly? Which plan is the most effective in reducing poverty? the least effective? Which plan embodies the strongest disincentive to work? the weakest disincentive to work?
   - **c.** Use your answers in part *b* to explain the following statement: "The dilemma of public assistance is that you cannot bring families up to the poverty level and simultaneously preserve work incentives and minimize program costs."

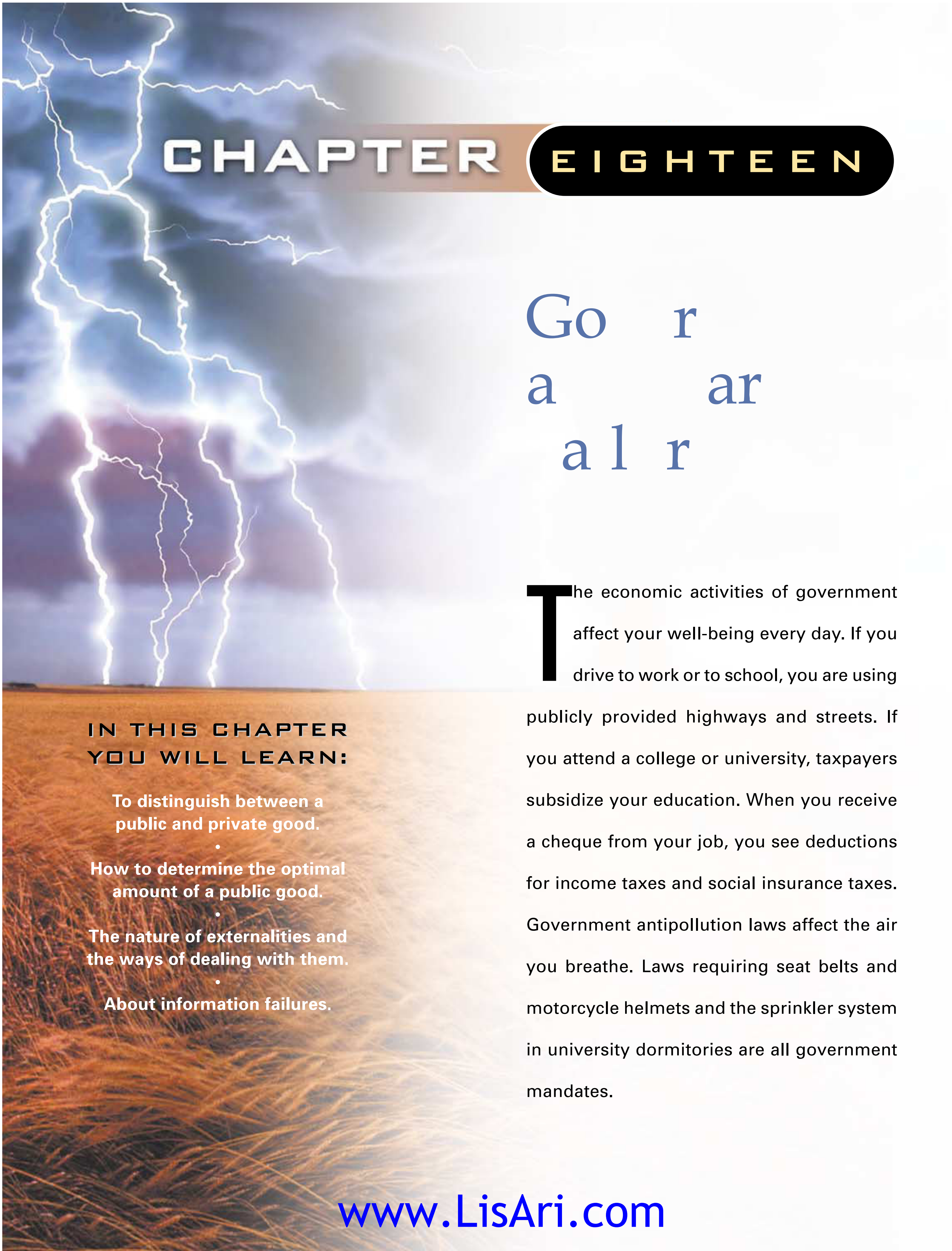
10. **(The Last Word)** How do poor people describe "well being" and "ill-being"?

Plan One			**Plan Two**			**Plan Three**		
Earned income	**Transfer payment**	**Total income**	**Earned income**	**Transfer payment**	**Total income**	**Earned income**	**Transfer payment**	**Total income**
$ 0	$4,000	$4,000	$ 0	$4,000	$ 4,000	$ 0	$8,000	$ 8,000
2,000	3,000	5,000	4,000	3,000	7,000	4,000	6,000	10,000
4,000	2,000	6,000	8,000	2,000	10,000	8,000	4,000	12,000
6,000	1,000	7,000	12,000	1,000	13,000	12,000	2,000	14,000

INTERNET APPLICATION QUESTIONS

Σ-STAT

1. Statistics Canada at <www.statcan.ca/english/Pgdb/People/Famili.htm#inc> compiles information about low income in Canada. Use that site to answer the following questions:
   - **a.** Is the percentage of the population living below Statistics Canada's low income cutoff higher or lower than in the previous year reported? Compared to a decade earlier?
   - **b.** Is the poverty rate (in percent) higher or lower than the previous year for the general population and children under 18 and the elderly?



CHAPTER EIGHTEEN

Go r
a ar
a l r

IN THIS CHAPTER YOU WILL LEARN:

To distinguish between a public and private good.

•

How to determine the optimal amount of a public good.

•

The nature of externalities and the ways of dealing with them.

•

About information failures.

The economic activities of government affect your well-being every day. If you drive to work or to school, you are using publicly provided highways and streets. If you attend a college or university, taxpayers subsidize your education. When you receive a cheque from your job, you see deductions for income taxes and social insurance taxes. Government antipollution laws affect the air you breathe. Laws requiring seat belts and motorcycle helmets and the sprinkler system in university dormitories are all government mandates.

s a r a *ma ke fail e* a r s a r a ar s o o r a o allo a o o r so r s a s sa s s so y's a s. r r a ar s a l, a o o rol or o r ay ar s . s a r a o o r r s o s o r y s o ar a l r l oo s, r al s, a or a o asy r s. r s ss o o r-al s r o s ay or a s ss o o oll o a oll o ol s. a r 1 o r s ss o o ro o o s o o r o s a a alys s o o al o r s all *go e nmen fail e* a o o so a a o .

PUBLIC GOODS

The Role of Governments

all ro a r a a r a oo s *di i ible* a s o s s s all o or al y rs o a or . s also s o *e cl ion inci le* o-l ll or a l o ay or ro ar arr ro o a s s. a s o s ara r s s, a or a r a oo s r ss ar la , a ro -s s l rs sa s y a a . o ras , a l oo s *indi i ible* a o s o l s o r l . a ro r as ro-a l oo , a o ar os o o ' ay ro o a s. o s ly, a or oo s rs a ar la , a r s s la a ro oo r or sal . oo s o s a all, o r ll a o ro . o s l a l s ll l lar y s as. ar a or a r a oo s or o al s a o o a r s r r s all al y rs (r a l -2 a r -2). os s o o l so y oy o o s, os $. 0 a o ro-. a s a s o y r o o s a $1 a a so a s o y o o o s a a sa r , ar a r ll r a o o s ar a a a $1 r . s ll r ar $1 or a o o a a $ o r - a ar $1 o ro ($ o o al r s $ o os). s a o s r l oo s. os a r r s s l or r a s a o ar os $ 00 a la s o s ar . lso s os a a s s $ 00 o oy ro ar a so s $ 00. s s oy a o o a a ro , s l or a roa s a s or a o a-o al o s sa s a o . a s als ly says a , or a ly, o s ' l . s l or r s so , o o $ 00 or so. a al so ro ss s o o l r. a s a so a o *f ee ide* . l o l a l y, o r aso a a s o s s o ay or so yo a r s o ay or . ar s s a l ar r o s r o ry a y l a a a . G ral a o a s o r -r r ro l , ar a or a - l oo s o s or s a ly rs a . r a ro r a o l os o o o ay ro r s ro a oo , s l , o oss l , or ro r o ro a ly o r oo or sal . Go r ll a o ro .

Demand for Public Goods

<members.aol.com/trajcom/private/commons.htm> The commons

o s rs o r al r r a or a l oo ar la , o a o al a o o a oo r a s r s a o r as o ry o s a a or a l oo ro s r ys or l o s. os a s a so ar o ly o o l so y, a r ar al ll ss o ay or a l oo , s a o al , s as

TABLE 18-1 DEMAND FOR A PUBLIC GOOD, TWO INDIVIDUALS

(1) Quantity of public good	(2) Adams's willingness to pay (price)		(3) Benson's willingness to pay (price)		(4) Collective willingness to pay (price)
1	$4	+	$5	=	$9
2	3	+	4	=	7
3	2	+	3	=	5
4	1	+	2	=	3
5	0	+	1	=	1

s o ol s 1, 2, a a l 1 -1. o - o s s a s o r s s l s ro a s r y as y o al s o s a o o a as ll o ay or ar o s y s a a o s o l oo s ra r a o o .

o a s l s a l 1 -1 ar r a y s l s, ly a y ar a s l s. a r a

a s al ay a y o a ro so o s ll o y a a os- s l r s s l s s o r so o s ll o ay or ar al o a oss l a y. a s, a s s ll- o ay $ or rs o l oo , $ or s o , $2 or r , a so o .

os o r ro s o o s l oo . a s l s o r l o s o a ly, a s's o s o o oo o s o r - l so ro also o s , a rsa. o o o s oo , a r ol rs o ay or . ro a l 1 -1 a a o s o o l o l ll o ay, o r, ra r a o o s o o oo . ol s 1 a 2 s o a a s o l ll o ay $ or rs o l oo ol s 1 a s o a so o l ll o ay $ or . o o o l ar o ly ll o ay $ ($ + $) or s .

or s o o l oo , oll r y ar ll o ay s $ ($ ro a s l s $ ro so) or r y ll ay $ ($2 l s $) a so o . y oll ll ss o ay or a a - o al (ol), a o s r a oll a s l (a ll - ss- o- ay s l) or l oo . r , ar o a a s a a a oss l r as r ar a or a r a oo . s a , ar a *he ice ha eo le a e illing o a fo he la ni of he blic good a each o ible an i demanded.*

r 1 -1 s o s sa a ro r ra ally, s a a ro a l 1 -1. o a s a s's a so 's ll ss- o- ay r s *e icall* o r oll ll ss- o- ay r (a r). or a l , o oll a r D_c a o s o o , s $, s o a o s a a s a so ar a ll o ay or s o ($ + $). s , o oll a r a o r so l oo s $ ($1 + $2).

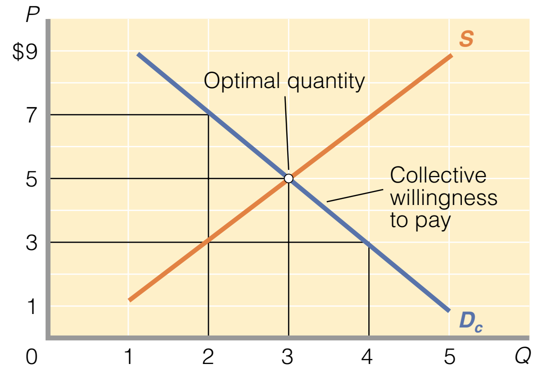
a o s a r 1 -1(a) a , or a l , a s s ll o ay $ or s o o l oo a s a a s s o r $ o ra or l y ro a . o ro la o s ar al l y a s ss s o a y oo y l l ss a l ss a . s s also r or l oo s, la o ar slo o ll - ss- o- ay r s o o a s a so , a o oll a r . s r s, ss , ar ar al- r s. (*Key Question 1*)

Supply of Public Goods

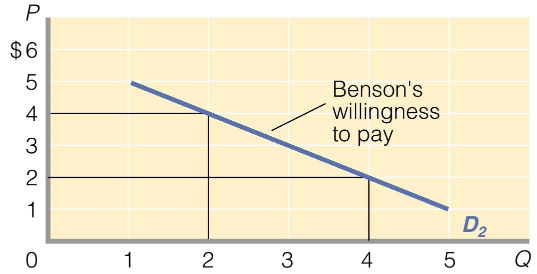
s ly r or a y oo , r a or l , s s ar al- os r . ar- al os r s s as or o a oo s ro . r aso s la o s r r s, a l s r a so y s a ss l s (a l oo) or rs (a r a oo). s or r , o r as r so r s (l a al) o ro l oo s s as a o al . s a s

FIGURE 18-1 THE OPTIMAL AMOUNT OF A PUBLIC GOOD

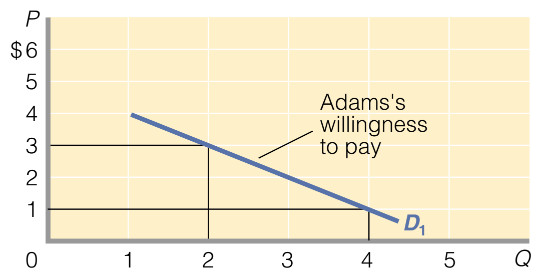
The collective demand curve for a public good, as shown by D_c in panel (c), is found by summing vertically the individual willingness-to-pay curves D_1 in panel (a) and D_2 in panel (b) of Adams and Benson, the only two people in the economy. The supply curve of the public good represented in panel (c) slopes upward and to the right, reflecting rising marginal costs. The optimal amount of the public good is three units, determined by the intersection of D_c and S. At that output, marginal benefit (reflected in the collective demand curve D_c) equals marginal cost (reflected in the supply curve S).



(c) Collective demand and supply



(b) Benson



(a) Adams

or s o a ar a l r so r (la o r) o s r so r s, o al ro ally r s s a a s ra . a a s a ar al ro alls a ar al os r s s, la y r *S* r 1 -1( ) slo s ar .

Optimal Quantity of a Public Good

a o r o al a y o l oo . oll a r D_c r 1 -1( ) as r s so y's ar al o a o s ar lar oo . s ly r *S* a r as r s so y's ar-al os o a . o al a y o s l oo o rs r ar-al als ar al os , or r o r s rs . r 1 -1( ) a o s r s o l oo , r oll ll ss o ay or las (r) ar al s a s a 's ar-al os ($ $). s sa a r 2, a ar al a ar al os ly allo a s so y's s ar r so r s. (***Key Question*** 2)

Cost–Benefit Analysis

COST–BENEFIT ANALYSIS Comparing the marginal costs of a government project or program with the marginal benefits to decide whether to employ resources in that project or program and to what extent.

a o a l s s s a ra al a s, all **cost benefit analysis,** or r o ro a ar lar l oo a o o o ro . o r a l , os a alys s (or ar al ar al os a alys s) ol s a o ar so o ar al os s a ar al s.

CONCEPT

os ral o r s o la a ay o s r o la . a s o o y's r so r s ar l , a y s o o s or r so r s l s or ll a r r so r s or r a s or. r ll o a os a a . os s loss o sa s a o r s l ro a o a- y l ro o o r a oo s s ra sa s a o r s l ro o o or l oo s. o l r so r s s ro r a o l s or a s r s y s ro ra l oo s s os a r s l s ro a r r a oo s. a s r s o os o or o r a oo s s r a r a asso a ra l oo s.

os a alys s, o r, a a or a r a l ro ra s or o . a also l o r o o a ro- s o l rs . al o o s o s a o s ally a s r s - ly y y s or o , ra r, ar a rs o o or o l l .

ILLUSTRATION

l o a r a oll roa s s , ays l arly a l oo ara - r s s a s s ar ly s a l s o r l s o as ly a l . o l ral o r a ral ay sys so, a s ro r s or s o or o rall ro a l 1 -2 l s s a s r s o r as ly a o s a r as ly os ly ay ro s s o-la ays l o-la ays l o r-la ays l s -la ays. o o r s o l r a ay o s r o s o os s a s. os s ar lar ly os s o o s r a a a - ays s a ro o o o l a oo s ro o a o . a l s o s a o al (ol) s o al os (ol 2) or la s , , a , a a so ay o s r o s o o ally s - a l . s s r ly ol , r o al os s (ol 2) ar s ra

TABLE 18-2 COST–BENEFIT ANALYSIS FOR A NATIONAL HIGHWAY CONSTRUCTION PROJECT, BILLIONS OF DOLLARS

(1) Plan	(2) Total cost of project	(3) Marginal cost	(4) Total benefit	(5) Marginal benefit	(6) Net benefit or (4) – (2)
No new construction	$ 0		$ 0		$0
		$ 4		$ 5	
A: Widen existing highways	4		5		1
		6		8	
B: Two-lane highways	10		13		3
		8		10	
C: Four-lane highways	18		23		5
		10		3	
D: Six-lane highways	28		26		–2

ro o al a al s (ol). s ar os or la s , , a . la s o o o ally s a l a s s ar a . s o o o al s or s o or s ro r a s. o ar a o al, or ar al, os a a o al, or ar al, r la o a la r s a s r. l s ll o o yo ro r o s s- ss o s r as a a y, ro , or o as lo as ar al (ol-) s ar al os (ol). o a y a , or as los as oss l o, o a ar al als ar al os . o o r a a ro or ar al os s ar al . s as la (l o r-la ays) s s la . la s a ar oo o s ar al s s ar al os s. la 's ar al os ($10 ll o) s ar al ($ ll o) a r or a o s o rallo a s r so r s o ro . la s los s o or al o a s s ar al ($10 ll o) s ll s ar al os ($ ll o) a roa s (or) al.

MC = MB RULE For a government project, marginal benefit should equal marginal cost to produce maximum benefit to society.

s **marginal cost = marginal benefit rule** a ally lls s la ro s a ss o o al s o r o al os s, or o r or s, la a ro s so y a . o a o r r ly ol a a (o $ ll o) s asso a la . os a alys s s a rs y a o o y o r a r o r s ar sy o y o s. o o y s o r s s ar r so r s ly. os o a ro os o r ro ra s s s, ro os l ro ra s o l o r a , s os , o l o o al or as l o o s o a o r ro ra . o o y o r o s o a a o o l s a s allo a r so r s r a a l s ors o a a . (*Key Question 3*)

QUICK REVIEW

- The demand (marginal–benefit) curve for a public good is found by vertically adding the prices all the members of society are willing to pay for the last unit of output at various output levels.
- The socially optimal amount of a public good is the amount at which the marginal cost and marginal benefit of the good are equal.
- Cost–benefit analysis is the method of evaluating alternative projects or sizes of projects by comparing the marginal cost and marginal benefits and applying the MC = MB rule.

EXTERNALITIES REVISITED

EXTERNALITIES Benefits or costs from production or consumption accruing without compensation to nonbuyers and nonsellers of the product.

r or s allo a o o , o r o o ly ro s l oo s also orr s or s o ar a l r all **externalities** or s llo rs. all ro a r a a s llo r s a os or a a r o a al or ro a r ar y a s *e e nal* o a ar ra sa o . a l o a s llo r os or a a r al y s os o r a oll ar a a a - l o a s llo r or a os r al y s o a ryo ls o la a a s so s as . r ar s llo r os s, a o r ro- o o r la ro o rs as o s a o rallo a o o r so r s o s ro . o rs ly, r ro o a rallo a o o r so r s r s l s llo r s ar r s . a o s ra o ra ally.

Spillover Costs

r 1 -2(a) ll s ra s o s llo r os s a allo a o o r so r s. ro rs s so o r os s o o o y as s llo r os s, ro - rs' ar al os s ar lo r a o r s . o r s ly r s o o l or a r all os s l a ly asso a ro o o r oo s. oll ro r's s ly r s as *S* r 1 -2(a), r or , r- s a s o al os o ro o . r 's s ly r l s o r o (or lo) ll- os s ly r *S* a o l l s llo r os . ro oll a s ra s rr os o o rs so y, r oys lo r ro- o os s a as s ly r *S*.

o o s s o r 1 -2(a), r l r o Q_e s lar r a o al o Q_o. s a s a r so r s ar o rallo a o ro- o o s o o y oo a y s o ar ro .

<www.best.com/~ddfr/Academic/Coase_World.html> Coase and the Nobel Prize

Spillover Benefits

r 1 -2( ) s o s a o s llo r s o r so r allo a o . s llo r s o r, ar a r *D* l s o l o (or lo) ll- s a r . a s, *D* o s o l s llo r s o ro , r as *D* o s. o s r o la o s a a s a o a l s as . a so a r y a a so o r asso a s l ar a rso o ar l ss l ly o o ra s as ro . ar a r r s o ly r , r a s o a so a - r o s o r s llo r s os r al s o l ar a rso , ar l *D* .

o o s a l r o Q_e s l ss a o al o Q_o. ar a ls o ro o a a o s a r so r s ar rallo a o s ro .

o o s s a lor s ral a roa s o ro l s o s llo r os s a s. 's rs loo a s a o s r o r r o s o a a so oss l o r sol o s.

COASE THEOREM The idea first stated by economist Ronald Coase that spillover problems may be resolved through private negotiations of the affected parties.

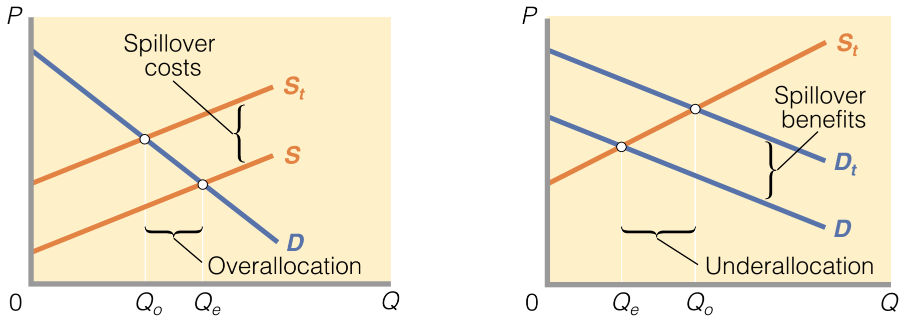
Individual Bargaining: Coase Theorem

Coase theorem, o y o o s o al oas a rs y o a o, o r s o o r y s llo r os s or s r

KEY CONCEPTS The Effectiveness of Markets

FIGURE 18-2

Panel (a): With spillover costs borne by society, the producers' supply curve S is to the right of (below) the full-cost curve S_t. Consequently, the equilibrium output Q_e is greater than the optimal output Q_o. Panel (b): When spillover benefits accrue to society, the market demand curve D is to the left of (below) the full-benefit demand curve D_t. As a result, the equilibrium output Q_e is less than the optimal output Q_o.



(a) Spillover costs

(b) Spillover benefits

(1) ro r y o rs s l arly , (2) r o o l ol s s all, a ( ) ar a os s ar l l . r s r s a s o- r s o l o s rol o o ra ar a a - als or ro s. ro r y r s la a r a o a r al y, r a o or y os s or all ar s. a s o o s l- r s s o ar s ar a s a , ar a ll a l o a ally a a l sol o o r al y ro l .

EXAMPLE OF THE COASE THEOREM

os o r o a lar ar l o or s la s o s r a la o l ar- (o ally l l) r s o ar s o a r r r s. o l a o s a or s s rro s a la a o lar r sor o s s or . r sor s o la o s. s o l a y o ral ar a a ra s a a o rs ro all o r a o o r sor , a r sor o r s a a s l ar- . o l ro - al or al o r r o allo or r r or o oas or , or s o r a r sor o r a r sol s s a o o o r r o . s lo as o o ar s o s as ro r y r s o a s a ss , a ll s or o ar s o o a a sol o a a l o a . o r a l , o r o rla ol s ro r y r s o la o lo a s as r o l ar- . o r o r sor , r or , as a o o o o- a or s o r or lo a . ss lo o or- s s rro r sor ll r o r s a r s o r sor o r. a s o o o or s o r o o a r sor o r a s r ra s r ly o a o o or y os . os rr lo or s s or o ay a or s o r o l o a ro r sor o r or a r o o l ar- r r s. r sor o r ll o a a l -s or a al ay o o r o or s o a o or s llo r os . r r a s r sor o r ll o y or s la o r lo . s y or s o r, a ay or o l ar- or a r as r a o ar al o la s a o or y os o lo la . s l ly a o ar s o l r ar a o a a r as r a l ar- rs.

LIMITATIONS

or a ly, a y r al s ol lar rs o a ar s, ar a os s, a o y ro r y s as a r a a r. s s a o s r a ar a a o s as a r y. s a a l , lo al ar ro l a s ll o s o o l a y a o s. as r o a ar- s o l o ally o a a a r or y s ro l . s a , y s r ly o r o r s or r s ll o s o a ar s a a a a l sol o .

r l ss, oas or r s s a a y s a o s, ar a r a ar s a s l r y s llo r os s a s llo r s.

Liability Rules and Lawsuits

l o r a o a o ay o a r al s sol o o a y r al y ro l s, l arly s a l s ro r y r s ay l a o r ay. o r- as r a ra or o la s a r a ro r y a ro ro a a o yo r ar s. os la s, a a a r o ry sys o y r s , r ar s s r s llo r os s os or o sa o . os a r as r o a y r larly s l a y arr ls o a sol s o a ar y a yo o y ar a . ar ally s o rs s s a , a r ra r s o a , a ly o a s s la y r. oo a r, ar s s a . o o ly ll a a o ay or l a ay also a o ay ar a o al a a s or r s ro r y.

l arly ro r y r s a o r l a l y la s s l r y so r al y ro l s. y o so r ly y or r ra or o ar - l r al y o ay a a s o os r . y o so r ly y s o ra - r s a als ro ra s llo r os s or ar o s . s o s r r s , , a a ys llo rs o o ol r a ro r y ra r ro r y l o o y so y. s l o so a r, l la s, a l a r, r o rs s l ss l ar, a o ar r o s llo rs.

a a s or r r l r a o a o s, r a la s s o r sol r al s a ro l a o s. ar l al s a a or lays o r sys ar o o la . lso, r a y asso a o r o - o r s ss o s a roa . ll o r a yo r la a yo r ys a as r s l ro s o y a ory oor, or ll o l a yo r a l s r la o la ’s oll o a yo ro a a s r ar a s so r o o a a o o yo r ll a a s o ar ’s s a r as r o so o s ss r l a o

Government Intervention

Go r r o ay o a o o y r al s a lar rs o o l or o y r s s ar a s a . Go r a s r o rols a a s o o r s llo r os s o - r ay ro s s s or l oo s o al s llo r s.

DIRECT CONTROLS

r ay or s llo r os s ro a r a a y s o ass l sla o l a a y. r o rols or o r s o r a al os s o o a y. o a , s a roa as o a l ol y a a a. s or ally, r o rols or o or ss o s s a - ar s l so allo a l oll o a o a r a a r oll o ol- y. l a a r l sla o or s a or s, ars, a s ss s o s all a a a l o rol olo y o r ss o s. l a - a r l sla o l s a o o a y als, r s, a o r oll a s r s a s ar o r rs a ays. o - as la s a s al ro r s a s s or s os o o a a so l a sol s. ola s la s a s s a , so as s, r so .

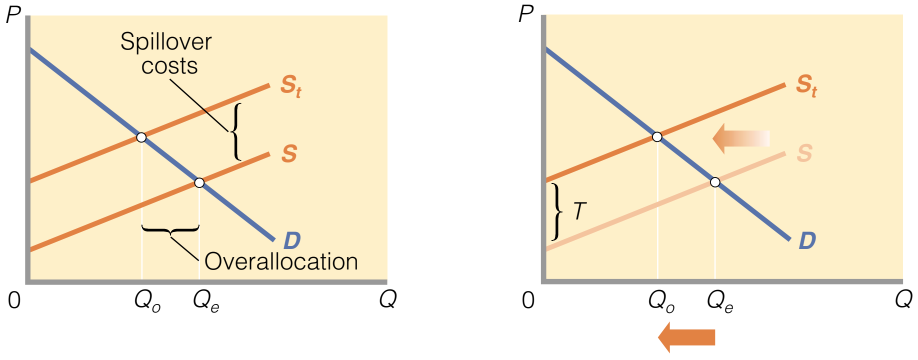
r o rols ra s ar al os o ro o a s r s s o r- a a a a oll o - o rol . s ly r S r 1 - ( ), o s o r s llo r os s, s s l ar (ar) o ll- os s ly r , S . ro r r as s, l r o alls ro Q_e o Q_o, a al o rallo a o o r so r ss o r 1 - (a) s orr .

SPECIFIC TAXES

s o ol y a roa o s llo r os s s or o r o l y a s or ar s s ally o r la oo . or a l , o r as la a

FIGURE 18-3 CORRECTING FOR SPILLOVER COSTS (NEGATIVE EXTERNALITIES)

Panel (a): Spillover costs result in an overallocation of resources. Panel (b): Government can correct this overallocation in two ways: (1) the use of direct controls, which would shift the supply curve from S to S_t and reduce output from Q_e to Q_o, or (2) the imposition of a specific tax T, which would also shift the supply curve from S to S_t, eliminating the overallocation of resources.



(a) Spillover costs

(b) Correcting the overallocation of resources via direct controls or via a tax

a a r s a o s, l s ra os r o o lay r ro- ar ro ss solar l ra ol ra a o . a s a s a , a a r rs s r o ay a or a o al s o r as or lo s s ro s. r as , a ra s s ar al os o ro s, s r a s ly r or s ro l ar (or ar).

r 1 - ( ), a a al o T r r as s r ’s ar al os , s - s ly r ro S o S . l r r r s s a l r o l s ro Q_e o o o ally l l Q_o. a s l - a s al o rallo a o o r so r s.

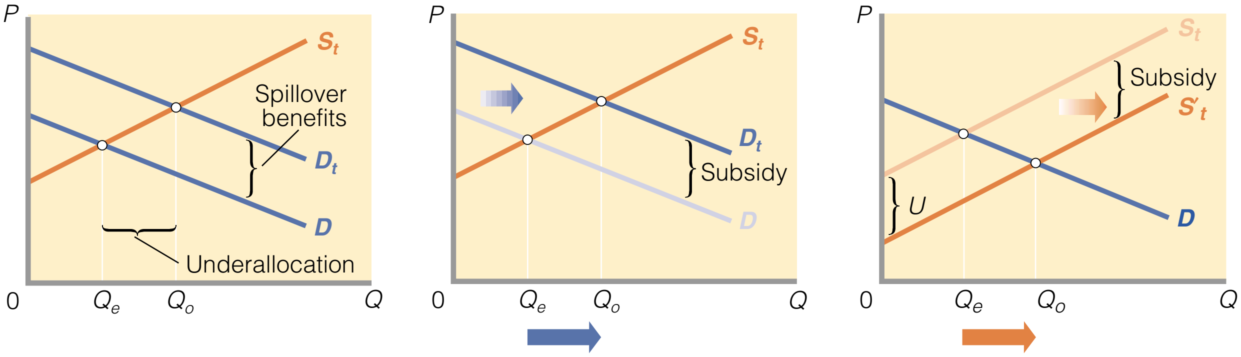
SUBSIDIES AND GOVERNMENT PROVISION

r s llo r s ar lar a s , as o r arl r a l o o la- o s, o r as r o o s or orr rallo a o o r so r s

1. ***Subsidies to buyers*** r 1 - (a) a a s o s s ly a s a o or s llo r s. Go r o l orr rallo a o o r so r s, or a l , o o la o s, y s s o s rs o ro . o l a o r a a a a s o o o o s oo a a s r s o o la o s or r l . o o o l r r o o r y, say, 0 r . s s o r 1 - ( ), s ro ra o l s a r or o la o s ro oo lo D o a ro r a D . - r o o la o s o l r s ro Q_e o o o ally o al Q_o, l a - rallo a o o r so r s s o r 1 - (a).

2. ***Subsidies to producers*** s s y o ro rs s a s a r rs . a s os a ra os o ro rs, l s s s r ro rs’ os s. s s o r 1 - ( ), a s s y o U r o la o o ys a s a al l s o l r r ar al os s a s r s ly r r ar ro S o S'. o o o la o s o l r as ro Q_e o o al l l Q_o, orr rallo a o o r so r s s o r 1 - (a).

FIGURE 18-4 CORRECTING FOR SPILLOVER BENEFITS (POSITIVE EXTERNALITIES)



(a) Spillover benefits

(b) Correcting the underallocation of resources via a subsidy to consumers

(c) Correcting the underallocation of resources via a subsidy to producers

Panel (a): Spillover benefits result in an underallocation of resources. Panel (b): This underallocation can be corrected by a subsidy to consumers, which shifts market demand from D to D_t and increases output from Q_e to Q_o. Panel (c): Alternatively, the underallocation can be eliminated by providing producers with a subsidy of U, which shifts their supply curve from S_t to S'_t, increasing output from Q_e to Q_o.

TRAGEDY OF THE COMMONS Air, water, and public land rights are held in common by society and freely available, so no incentive exists to maintain or use them carefully; the result is overuse, degradation, and pollution.

. *Government provision* ally, r s llo r s ar r ly lar , o r ay o ro ro as a l oo . a a a o r lar ly ra a r l s as ol o y a s r r a s o all l r . a s all o y ay o l r ral ar as o o o l l s o a r l r a a . (*Key Question 4*)

A Market-Based Approach to Spillover Costs

o la roa o s llo r os s ol s o ly l o r a o . a s o r a a ar or r al y r s. or s r a a roa , rs o rs a a all **tragedy of the commons**.

THE TRAGEDY OF THE COMMONS

a r, r rs, la s, o a s, a l la s, s as ar s a s r s, ar all o s or oll o a s r s o s os r so r s ar l o o y so y. o r a al or s o as a o ary o a a r y or al y o s r so r s.

a a ro r y o , a a r a r o r o s r o ally, or a l , ar a s llr o al o s ro s a o sal . as lo as r s o a r, a r, a r a la r so r s ar o o ly l a ar r ly a la l , o s s o a a or s ar - lly. s ar s l , s a ral r so r s ar o r s a ra or oll . or a l , a o o as r a yo a ra a l ll ly o r ra , a s a ra r as a o ra as a y a l as oss - l . larly, o o ly o r so r s s as r rs, la s, o a s, a a r s yo r a a y o a sor oll o . a a r rs ll oos

<www.ecoplan.org/com_index.htm>
The commons sustainability agenda

l as - os o a o o s a ar o ly a o a l os s. y a as als o r rs a la s ra r a ay or ro r s osal, so s ss s ll l o o so. r s ll s ar s o o a r y a , ra r a r as s a a a l s. ral, ro al, a al o r s so s s ar a a ly r a as o r rs, la s, or o a s o a o s o o s r s r a a l s. a y als a o os s o ro r r s a s osal y r r ar a or oo s.

ro l s a ly o o s. r s o o r r al os s asso a r or l a oll o os os s a ra s rr r ally o so y. alla y o o os o also o s o lay. a rso a r r aso s r al o r o o oll o s so s all a s o l l or o o rall o s . r a o s, l l y - r s, o sa s, or ll o s, o r l a sor a a y o o o r so r s. o y s a ra a o or oll o ro l .

MARKET FOR EXTERNALITY RIGHTS A market in which firms can buy rights to discharge pollutants.

A MARKET FOR EXTERNALITY RIGHTS

The Effectiveness of Markets

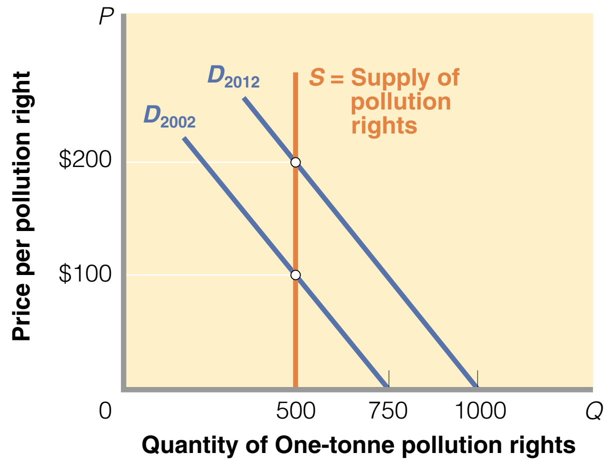
s o o s r s o a o l ol y a roa o s llo r os s o a s ar or . a s a o r a r a a **market for externality rights**. o o r s ss o o oll o , al o s sa a roa s o r r al s.

OPERATION OF THE MARKET

s ar a roa , a a ro r a oll o - o rol a y o l r a o o oll a s a r s a s ar o a r or a r o a s r o a ally l a a a r or a r al y a y a so a a l l l. os a y as r a s a 00 o s o oll a s a s ar o ro ol a a a r y l y a r a y ar. 00 oll o r s, a l o r o o o o oll a s o la o y ar, ar a a a la l or sal o ro rs a y ar. s ly o s oll o r s s a , r or , r ly las , as s o r 1 - .

FIGURE 18-5

The supply of pollution rights, *S*, is set by the government, which determines that a specific body of water can safely recycle 500 tonnes of waste. In 2002, the demand for pollution rights is D_{2002} and the one-tonne price is \$100. The quantity of pollution is 500 tonnes, not the 750 tonnes it would have been without the pollution rights. Over time, the demand for pollution rights increases to D_{2012} and the one-tonne price rises to \$200. But the amount of pollution stays at 500 tonnes, rather than rising to 1000 tonnes.



a or oll o r s, r r s y D_{2002} r , a s sa o slo or as a or a y o r . r r s r s l ss oll o , as oll rs r s o oll or oll l ss y a r oll o - a a . l r ar r or oll o r s, r $100, ll r a ro - r s r a y o oll o r s s ra o o oll rs. r 1 - s o s a s o la as a s or oll a s r r , 0 o s o oll a s o l s ar o la o l o r o s , or oll , a o o 2 0 o s. r , as a a s ss o la o s a , a ll r as , as ro D_{2002} o D_{2012}. o a ar or oll o r s, oll o 2012 o l 1000 o s, 00 o s yo a a ass la y a r . ar or oll o r s, r o l r s ro $100 o $200, a a o o ol- l a s o l r a a 00 o s a o a la a r y l .

ADVANTAGES

s s as s ral a a a s o r r o rols, os or a o s a r s so y's os s y allo oll o r s o o a sol . os os s l ll $20 a y ar o r a s o o s s- ar y o o l os s o als $ 000 a y ar o a o l s sa o - o r o . lso ass a o a s o a ro o , o so ll r as s oll o s ar y o o .

o a ar or oll o r s, o o l a o s $ 000 o so y's s ar r so r s o o - o oll o s ar ro o rr . a ar or oll o r s, o as a r o o ys o o o oll - o r s or $100 r s o r 1 - . s ll o s ll o o o o oll o r s or $100 a s a a o s or a 's $20 os o r s oll o y o o . o r as s s s ar y o o r s s s ar y o o . o s (y $ 000 $100), s (y $100 $20), a so y s (y $ 000 $20). a r a s $ 000 o s s ar r so r s o ol s ar a s l l, so y s s o ly $20 o os r so r s.

ar - as la s a o r a a a s. o al oll rs a a o ary o o oll a s y s ay or r s o s ar . o s r a o ro s a oll o y y a ol oll o r s, r y r oll o lo o r ally r s a ar s. s a or oll o r s r as s o r , ro r ro sal o a a y o oll o r s o l o o ro al ro . sa , r s r o oll o r s s o l s - la s ar or ro oll o - o rol s. a l 1 - r s a or o s or orr r al s.

Society's Optimal Amount of Externality Reduction

Choosing a Little More or Less

a r al s s as oll o r l y o os a , ra r a r as . s s llo rs ar o o o oo s o o a s. so s a , s o l ' so y l a y s o l so y allo r s or al s o s ar *an* r as o l a r ays or o *an* oll o o a r

a a r al y as a r . o y s o o a r o a s o y. l a oll o o s ra l , r olo ally as l . a s o la o s r r s, l a

TABLE 18-3 METHODS FOR DEALING WITH EXTERNALITIES

Problem	Resource allocation outcome	Ways to correct externalities
Spillover costs (negative externalities)	Overallocation of resources	1. Individual bargaining 2. Liability rules and lawsuits 3. Tax on producers 4. Direct controls 5. Market for externality rights
Spillover benefits (positive externalities)	Underallocation of resources	1. Individual bargaining 2. Subsidy to consumers 3. Subsidy to producers 4. Government provision

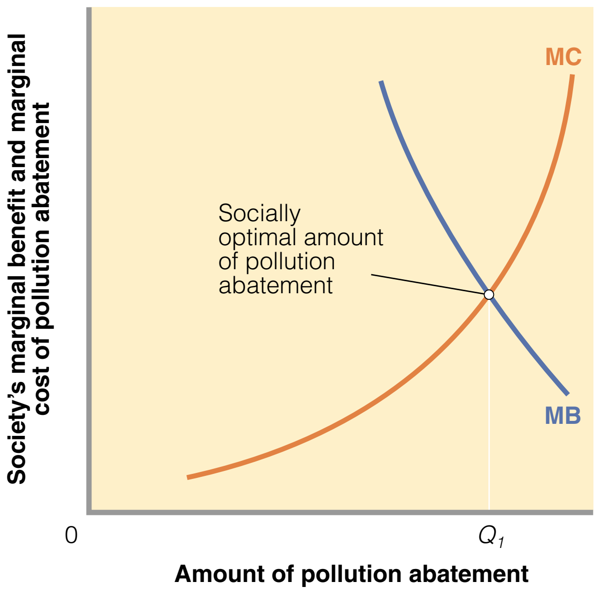
las 10 r o oll a s ro a s r al s o s a or ally s ar
or os ly a l a r or 10 r .
ar al os ( ) o r a o so y o or y os o
ra r so r s s r s s as oll o s r r r. so o
ay r s so a s so y’s ar al ( ) o r r oll o
a a (r o). o al a o s o r oll o ll r or lo r
so y’s ll- o al os ll r s or a o al .

MC, MB, AND EQUILIBRIUM QUANTITY

r 1 - s o s o r s ar al- os r , , or oll o r o
a o slo ar al- r , , or s o o . slo s

FIGURE 18-6

The optimal amount of externality reduction—in this case, pollution abatement—occurs at Q_1, where society’s marginal cost MC and marginal benefit MB of reducing the spillover are equal.



o ar a s o la o s ar al l y or oll o r o so y a o l s s, lo r l y (a) o o oll o r o .

optimal reduction of an externality o rs so y's ar al os a ar al o r a r al y ar al ( ). r 1 - s o al a o o oll o a a s Q_1 s. s , a o al a a o s so y o ar o o y a o l a r a r or a r s o a y al r a s o r r r so r s. s , a o al a a r s o o y r o l r a r s ro s r so r s so o r ay a o r r r oll o . r al y, s l o as r ar al os s a s o oll o o rol. r l ss, r 1 - o s ra s a so oll o ay o- o ally o a s oll o s s ra l a s yo so l l o o rol, r r a a ay r o r ll- .

OPTIMAL REDUCTION OF AN EXTERNALITY The point at which society's marginal cost and marginal benefit of reducing that externality are equal.

SHIFTS IN LOCATIONS OF CURVES

lo a o so ar al- os a ar al- r s r 1 - ar o or r . y a , a ro a ly o, s o r . or a l , s os a olo y o oll o - o rol r o ro o a ly. o l os o oll o a a o all, so y's r o s r ar , a o al l l o a a o r s . r s os a so y r o a a l a r a r a a r a s o or a o a o a rs al s o oll o . r r 1 - o l s r - ar , a o al l l o oll o o rol o l r as yo Q_1. s yo r rs a o s s a s y ra a r s r 1 - . (*Key Question 7*)

QUICK REVIEW

- Policies for coping with the overallocation of resources caused by spillover costs are (1) private bargaining, (2) liability rules and lawsuits, (3) direct controls, (4) specific taxes, and (5) markets for externality rights.
- Policies for correcting the underallocation of resources associated with spillover benefits are (1) private bargaining, (2) subsidies to producers, (3) subsidies to consumers, and (4) government provision.
- The optimal amount of negative-externality reduction occurs where society's marginal cost and marginal benefit of reducing the externality are equal.

Solid-Waste Disposal and Recycling

r al y ro l a as r s r a a o a a a s sol as s osal. roo a s o ro l a s o ro **law of conservation of matter and energy**. s la ol s a a r a ra s or o o r a r or o r y a r a s . ll s (ls, ra a r- als, a r, a so or) s o o y's ro o ro ss s ll l a ly r s l a al a o o as . or a l , l ss s o o sly r y- l , o o o a -s r l a ly ll a a o a los , r a , or r a ra or. s r , ll o a s s a , ll ra s or o a , s o , a as .

LAW OF CONSERVATION OF MATTER AND ENERGY Matter can be transformed into other matter or into energy but can never vanish.

la o o s r a o o a r a r y s os a ar sol - as s-osal. ll o so o so ar a a a la a ally a a a la -lls (ras s) ar a ro r al y ro l . a lls so r ar o ar lar ar r o l ly ll or ra ly ll . Gar a ro r a ls r s o ra s or r so l s o s o r al r s o s.

r , o l r ral ar as ar ly a s ar rs a a ly s a o r as r ra o r ays a ro o s o s lly ar a al s. or o r, so la lls ar ro s r o s a r-s ly oll o .

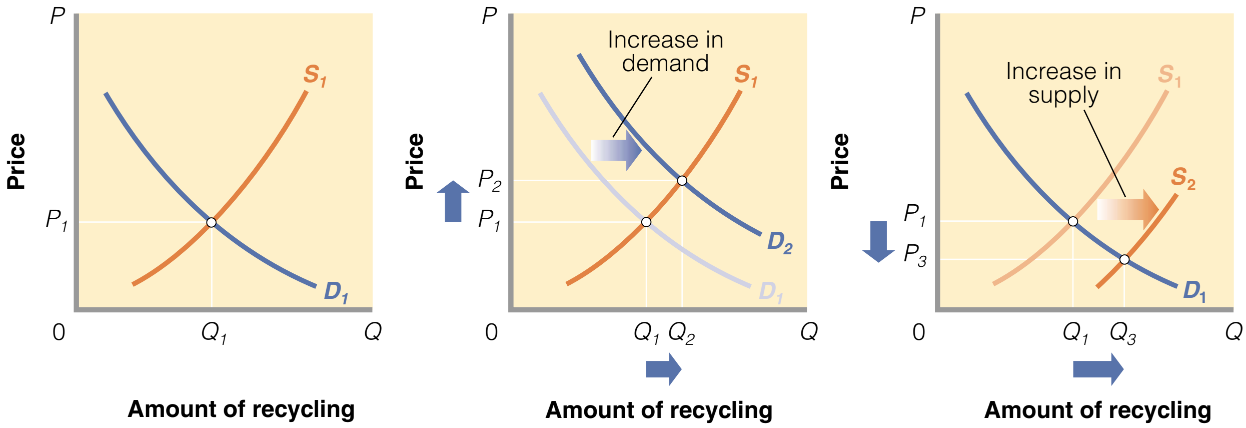
o or y os o r a a s r a la a a r-al s r a y s a la lls r as ly s . al r a ol-y s o ra ar a la s a ro l r y. o l o o a ar a ra ors, r a o a y r ra a a r oll o , los o r o s. s r a r sol o o ro ro l o sol as l o ar a s a ra ors r a r ary ar a s osal o s, r y l as r r as a o .

MARKET FOR RECYCLABLE INPUTS

r 1 - (a), s o s a a s ly r s or so r y la l ro , s as lass, s s s s or r y l .

a or r y la l lass r s ro a a r rs a s r y l lass as a r so r ro lass. s a r slo s o ar , ll s a a a r rs ll r as r r as s o r y la l lass as s r alls.

FIGURE 18-7



(a) Equilibrium price and quantity **(b) Incentives to buy recyclable inputs** **(c) Incentives to sell recyclable inputs**

Panel (a): The equilibrium price and amount of materials recycled are determined by supply S_1 and demand D_1. Panel (b): Policies that increase the incentives for producers to buy recyclable inputs shift the demand curve rightward, say, to D_2, and raise both the equilibrium price and the amount of recycling. Panel (c): Policies that encourage households to recycle shift the supply curve rightward, say, to S_2, and expand the equilibrium amount of recycling. These policies, however, also reduce the equilibrium price of the recycled inputs.

lo a o o a r r 1 - (a) s ar ly o a or ro s or r y l lass s s . r a r a or os ro s, r a r a or r y la l . lo a o o r also s o olo y a s os o s or - al ra a r als ra r a r y l lass ro o ro ss. or os ly s o s or al a r als r la o r y l lass, ar r o r ll a r or r y la l lass.

s ly r or r y la l lass slo s ar , a s r r s r as or o s ol s o r y l . lo a o o s ly r s o s a ors as a s o o s ol s o ar r y l a os o o al r a s osal.

l r r P_1 a a y Q_1 r 1 - (a) ar r a rs o o s ly a a r s. r P_1 ar l ars r s r a s or a or a s r l s o r y la l lass.

POLICY

os o r a s o o ra r y l as a al r a o la s or ra o . o l o a o o o ays.

Demand Incentives o r o l r as r y l y r as a or r y l s. a r r 1 - ( ) s s ro D_1 r ar o D_2, l r r a a y or r y l lass ll r as o P_2 a Q_2 or r y l ll o r. ol y a r as a o l o la a s o s a ar s s a l or r y l lass ro o ro ss. a s o l o ra r s o s or o a r y l lass a l ss o a s. r o r o l s s r as s o ar oo s ro r y l s a r r a s o ra ors o sa lso, ro al a ar ss y l a o r o r ar s s o a r or r y l r so r s. a y lar r s a ro as - s oo s a o l a s r r s o s or r y l , or ar o a o s r a las a a s r ro s. ro r & Ga l (s osa l a rs) a o al 's (a a o as oo) a r a l ll o - ollar a a s o s r y l las a a r.

Supply Incentives s s o r 1 - ( ), o r a also r as r y- l ys s s ly r r ar , as ro S_1 o S_2. l r r o l all ro P_1 o P , l r a y s as r y la l lass o l r s ro Q_1 o Q . a s, or r y l o l o r. a y - al o r s a l s ol s o o so. or a l , y o ra r y l y ro r s o r y la l oo s s as lass, al a s, a s a rs a a lo r o ly a or o o r ar a , or r o ar .

a as s, s ly s or r y la l s a so a r o a r y l as all o ro. o a s o s o o y s s ly r r 1 - ( ) ar r r ar . o s o ar ay s rs o r y la l s s as a r o r a ay ro r y l r , a s a s s a a a r . os o ay r s o a a ay r y la l ro s s lo r a os o al r a o s, s a - or r y l ll ro o o o y. o r, s or os ly o r y l ras a o ry or ra , r al s ar o - s r , s r y l ll r y ra r a r as . a , ar r a r a r oo l l or oo o a oo .

o r ’s as s o o al a o o r y l o ar al r a s osal o ar a . a o s y s a a o ar ar al a ar al os o r y l . o s rs as a ro a r a la o o ar a y y ro s a a al a a .

Global Warming

a a a a a s a a s a ro r ss l a r a r. or o a s ro ro o y, 1 0 a 2000 l a -a r la s a a oll o or s y s ss s a al o r - s r o ra o so ar o o o y r , l a y 0 r , ro o y 10 r , s o y r , ar la a r y 1 r , a s l r o y r .

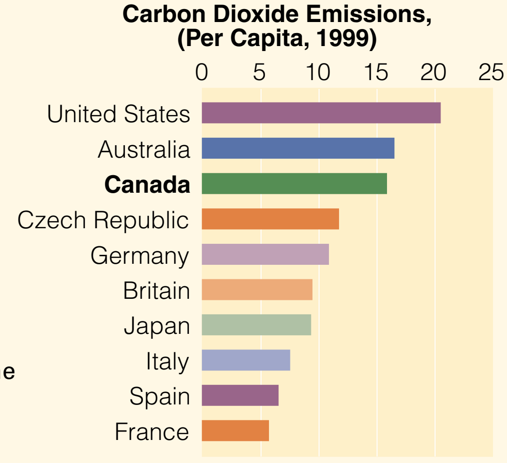
s a a r oll o ro l s r a . ll o s l ar as, s as so r ar o, a a al y l ls o a l as o o s a or a r ol- l a s l s a o . or o r, a a a a o r a o s o orl a r s s o *global a ming*. ala o s s ss a ar o o a o r as ss o s ro a or s, o r la s, a a o o l s ar a - la a os r a r a a r o s . s ar s l, a y s - s s r a a ra ra r s ll r s y 1 o r s ls s y 2100. r , al os all r o s o orl ll r o a l l a a s. a l ls ll ra ally r s y s ral s, a ra all a r s ll a . o a la o s ll l so r o s a r s o rs. ol s or s s as or a o s, y oo s, a rr a s o l r as r y a s r- y. o o s o lo al ar ll o or ool a - ra r o s a a o s ay o o ally , a o a ry r o s a a o s ay ar . Glo al rs 1 .1 l s s ar o o ss o s o a r a a as s or s l a o s.

orl ’s a o s a r s o o lo al ar ro l y ro s o l ro o ar o o a o r r o s ss o s. ally,

GLOBAL PERSPECTIVE 18.1

Carbon dioxide emissions, tonnes per capita, selected nations

Carbon dioxide emissions, the major type of greenhouse gas emissions, vary per capita by nation primarily because of different degrees of industrialization and energy production from fossil fuels (coal, oil, and natural gas). The burning of such fuels is the major contributor to global warming.



Source: OECD Environmental Data, <www.oecd.org>, Compendium, 1999.

<www.crt.umontreal.ca/~amit/papers/cjm.pdf>
The Kyoto Protocol

s r ally a a a o s a r 1 yo o ro o ol o r r o s as ss o s o r lo 1 0 1 ls y 2012. a a a o - o a r r o lo 1 0 1 ls y 2012. a y o o s ss s r a o r sol ro r r s a o a o s. or a l , o a s o l lo a o s s as a a a, rr ly ro l s, ar a r ss o s o l all s r al o r s or o a , say, a l as al r a r -o r o a o , ra r a y- ra a l ss o s r s ro o r a o s a a o r o s a o r s r s a l s as ar o yo o ro o ol.

o o s s s r ss a lo al ar ol s a r r o s as s- s o s a s slo or l a lo al ar r a os s as ll as s. s ra o o s r ar al os s a ar al s ar lly a ol y s o s. Gr o s as l ss o l o so s r a y os so y or a al o s y ro . l s s o l o so l a so y or o s s s a al o al s a o l a o r s a .

ASYMMETRIC INFORMATION A situation in which one party to a market transaction has much more information about a product or service than the other does.

o o s s also s r ss a ar a s , ro s sys o r s a ro s a loss s, ll a a ro r a a s s as o l a r al s. r o o r sal s ll r s s o s o l sal s ll all. o a r l ral la s ll s r o rs r r or ll l a . a l syr s ry a a a ay ro o la alls as a r s l o lo al ar . r l ss, *an i ion co* os s asso a a - o o a s s o lo al ar ll o ly ry o a o s ar a o r r o s as s. r o or l a o o s ra s o os s s ar o o slo or l a r o s . s s lly o s r os a alys s.

QUICK REVIEW

- The ultimate reason for pollution is the law of conservation of matter and energy, which holds that matter can be transformed into other matter or into energy but cannot vanish.
- Society's pollution problem has largely resulted from increasing population, levels rising per capita consumption, certain changes in technology, and the so-called tragedy of the commons.
- The government can encourage recycling through demand and supply incentives; its task is to determine the optimal amount of recycling.
- Under terms of the 1997 Kyoto Protocol, the industrial nations agreed to cut emissions of greenhouse gases by 6 to 8 percent below the 1990 levels by 2012.

INFORMATION FAILURES

KEY CONCEPTS The Role of Governments

s ar, a a a l a s s o r o y s o ar a l r l oo s a r al s. r s a o r, s l r, ar a l r a r s l s r y rs or s ll rs a o l or a ra or a o , a r os o o a r or a o s ro . ally s a , s ar a l r o rs a s o **asymmetric information** al o l oss ss y ar s o a ar ra sa o . y rs a s ll rs o o a al or a o a o r , al y, or so o r as o oo or s r .

ar or a o or ally s a a la l o s r a oo s a s r s ar ro a r as ly. so as s, a a or a o a s l o s s r s or y ro r s or y s ll-rs or r s or y ro r s or y y rs. s ar s, so y's s ar r so r s ay o s ly, ly a o r s o l r-y r as or a o a a la l o ar ar a s. r rar r s a s o r ay s l s ly a oo or or a o ro l s a ro ro o .

Inadequate Information Involving Sellers

a a or a o a o s ll rs a r ro s a a s ar a l r or o rallo a o o r so r s. a ar s or asol a or s r so s r o s lls o s o s o s a o .

EXAMPLE: THE GASOLINE MARKET

ss a a s r s a o os o sys o s a as r s as s a l s y la , o o r s o o asol s oo la , a o la a a s als a r s s . a as s a o a s a r as r oos s a a l r o as as l as s. s a o a a r s a s as s o a a so ly . a r s s o a a s ro-or as a a o l r .

o sly, o s rs' os o o a r l a l or a o r s ao o o s s o ally , o ro . s o rs or r r-r s a s o l a o y s a l s o as ro ar o s as s a o s, a s or o a l l, a s a ra y o al ra o s a . s a-s o l a o r a r larly, a s a s a o o r o l al r ro al y a a ra y o a ll.

a s o os s o o a or a o a o s ll r, a y s-o rs o l o o o s ao ar . a l o a 0 r sol o o asol a a r o l o o s o ra os o or s s ro r r r . or r al s ally, o o s s ar o l o ra o-s rs o o or ol al a a s o ro s o ro a o r al sol o . o l o a s a o s asol s a o s o l o o o o-r r o . y o l r al a a ra or a o , y a l s ar o or , o l a r o al sal s a ro .

o r as a r ar or asol a o r ar s s lar o al or a o l s. s a l s a sys o s a as r s, loys s ors o a ra y o asol s, a ass la s a a s ra l la s a sl a a r s . r a o o a s o r a s a ro s or so y.

EXAMPLE: LICENSING OF SURGEONS

os o a a yo o l a o as l a la o as r o , as a yo a o a o s a r. ar o l ally sor o r s r o s ro os o r l ar y o or r y- y- o ra-ors o o o a o o a ar a. s o l ro s ss l s r ry, la s s or al ra ally o l l a al os ors. o l s r ry or s l s or r lo o s o l o a or a o ro s a r r or s or ro o l o a r o s lar o ra o s.

s ro ss o o a or a o or os s r ry o l a o s ra l a o l os a a ly a a o o os s. r s a a al r a a a r s a o o o 's o s a o r o ar s r ry y a o s ys a . ar al os o o a or a o a o s ll rs s r ry ar o l ss ly . r s o ro o oo or a o o l r s l l ss s r ry a s ra l a rallo a o o r so r s o s r ry. o r as r s ar a l r ro a sys o al y s s a l s . l s ro s o s rs s or a o a o a s r y r ly y. o r as a a s lar rol s ral o r ar as o o o y. or a l , a ro s s, r - la s s r s s ry, a r r s ar s o o a rs o o ally a - ar o s s s a s. also r r s ar la ls o ar a a s a ss a s or a o a o o a l s as s. ss s ar s a o sa oys a s s r s a ra s or al -r la ola o s.

Inadequate Information Involving Buyers

s as a a or a o ol s ll rs a ar s ro a o o y, so a a a or a o r la o y rs. y rs ay o s rs o y ro s or r s a y r so r s.

MORAL HAZARD PROBLEM

MORAL HAZARD PROBLEM The possibility that individuals or institutions will change their behaviour as the result of a contract or agreement.

r a ar s ay rallo a r so r s o a ar lar oo or s r or r s a s r **moral hazard problem**. oral a ar ro l s - y o o ar y o a o ra o al r r or s a o r a r o ra s s ays a o l os ly o o r ar y. os a r o rs a s ra ol y a ays a s a o o o y r o o o l os r or s. a ra ss o s s ra s a o l ool o o r s o or a o o sa s o o l a , ar- lar, o l ro s o s s a l r ro o o ar s a or o r s. or a ly, oral a ar ro l r s l l- oo a s ra o a s a ro a ly ro s y o s ra . r a o s s ra , so o l o l al r r a o r ays a os a y os s o s r r. or a l , arr o l s o l a l ss o alo a o ro o ar al l s. r , so o l o a oo a a or , oll s ra , a o o l o r. s ra o l ro o or or s, ry o o s o ro a a s . oral a ar ro l o l or s r r o ar s r s or s s ra a ol s o l o . s r r o l y a a os o l os ro o al r r a o r, r o l l ro y . r 's ar al os o s or a o s oo o ar ar al . s, s ar o l a l.

l o or s ra s o a a la l ar la , so y r o - s s o s r a a s ar s s o or . as orr or s rallo a o o ar s s ra ro l -s or la s a a ay s o s o s or a s l r , o o r s a s arra s ay s. l o y la s also lay a rol .

oral a ar ro l s also ll s ra ollo s a s

- r rs ay l ss a o s a s y a ar s ra .
- al al ra s ra ay r as a o o al ra .
- G ara o ra s or ro ss o al a l s ay r al y o r r or a .
- loy o sa o s ra ay l a so or rs o s r .
- Go r s ra o a os s ay o ra a s o a r s y loa s.

ADVERSE SELECTION PROBLEM

ADVERSE SELECTION PROBLEM A problem arising when information known to one party to a contract is not known to the other party, causing the latter to incur major costs.

o r or a o ro l r s l ro a a or a o ol y rs s **adverse selection problem.** s ro l ar s s or a o o y rs ar y o a o ra s o o y s o a , as a r s l, s o ar y rs a or os s. l oral a ar ro l , ar s s a ra rso s s a o ra , a rs s l o ro l ar s s a a r- so s s a o ra .

s ra , a rs s l o ro l s a o l o ar os l ly o s ra ay o s ar os o y s ra . or a l , os oor- s al ll s o y os ro s al s ra ol s. r, a r , a rso la o r a arso s o or s a l s ss as a o y r s ra .

r y o al or s ra s s r r l o a rs s l - o ro l . s ra r s s r s as o a ra or ra , a y arr o l s o ar a o o o a a or ll y s ra . s ra r as o a ra ro a l s ll a a r a y or os a o o or . a l , os ly s a l arr a s ll o y .

a rs s l o ro l s s o l a ool o lo a r s s, s as s o ro a l s ra . s ra ra s s so a o l o l a o (or a l o) y s s ra .

r r a r s r ro s ra a s o or a o ro l s, o r o s a l s s so y o so al s ra . a r r ry- o a ar lar ro o a s ra a r y a o r o a rs s l o ro l . or a l , al o so al s ra sys a a a s ar ly s ra a ar ly a o ra s r ro ra , s roa s s s s ra a a s o r y r ol a . so al s ra ro ra r r s arly rsal ar a o o l o ar os l ly o - s a so al s ra ro s ar a o a ally ar a s ro ra . o, oo, ar os o l ly o s. o a rs s l o ro l s s.

WORKPLACE SAFETY

la o r ar also ro s a a l o o a a or a o a o y rs (loy rs) a ro ar a l r s.

or s ral r aso s loy rs a a o o o ro sa or - la s. sa or la r s a o o sr o o ro o ro ss r a y o a s a lo rs os s o r r , s r , ra - , a r a or rs. also r s a r 's or r o sa o s r- a r s (l ally r r s ra a a s o r s).

a sa or la s s sa , ro ar, a a slo r or a all a l os s. r ll o sa y o ro y o ar ar al os a ar al o ro a sa r or la . ll s a o o o sa y a o o y, as ll as a r 's ro

a s r sy s la o r a ro ar s ar o a or - rs ar lly a ar o o r s s a ar o s la s o loy . ll or- a o , or rs ll a o loy rs a sa or la s. s ly o la o r o s s a l s s ll r a ly r s r , or o oos r a s o a ra a or or . r a s ll s loy rs a o ro r as or la sa y sa r or la s ll r a s s. ly r s a ry os ly o ro sa r or la s ll oos o ay o sa a r als ra r a r or la a ar s. s r o s ro l ar s s or rs o o o a ar lar o a o s or or la s ar sa . a s or a o a o y r a s, a o loy r a or la s a a , r ay o o ay a a r o a ra s or or . s o r o sa y a ar s, r or , ll s , a s ro - a l l o or la sa y ll l ss a o o ally s ra l . r , la o r ar ll a l a s o asy - r or a o s as , s ll rs (or rs) a l ss or a o a y rs (loy rs).

o r as s ral o o s or r y s or a o ro l

- a r ly ro or a o o or rs a o ry r o ar o s loy rs, as l s s o - r or a o a rl s.
- a r r a r s ro or a o o or rs a o o or - la a ar s.
- a s a l s s a ar s o or la sa y a or ro s o s a al s.

l o ral o r as a ly loy s a ar s a or - a roa o ro or la sa y, so r s o a a or a- o s ra y l ss os ly a or . (*Key Question 13*)

Qualification

o l a o a y o s ays oo r o or a o l s - o o r r o . or a l , a y r s o r ro arra s o o r o la o or a o a o s l s a r ro s. ra s also l s o r o s ro l . yo s a o al 's or a ol ay , yo o r s ly a yo ar o o , as o os o s o a o 's a r r o or a s o l.

lso, so r a r s a or a a o s s al ro or a o o y rs a s ll rs. *Con me Re o* ro s ro or a o la o r o s oll a ss a or a o a o o sa y a r r a s ro or a o o s ra o a s. ro rs, o a s, a r ar s also ro or a o o l s.

o o s s a r , o r, a r a s or a o r y all or a o ro l s. so s a o s, o r r o s s ra l o ro o a allo a o o so y's s ar r so r s.

QUICK REVIEW

- Asymmetric information is a source of potential market failure, causing society's scarce resources to be allocated inefficiently.
- Inadequate information about sellers and their products may lead to an underallocation of resources to those products.
- The moral hazard problem is the tendency of one party to a contract to alter its behaviour in ways that are costly to the other party; for example, a person who buys insurance may willingly incur added risk.
- The adverse selection problem arises when one party to a contract has less information than the other party and incurs a cost because of that asymmetrical information. For example, an insurance company offering no-medical-exam-required life insurance policies may attract customers who have life-threatening diseases.

The LAST word

LOJACK: A CASE OF POSITIVE EXTERNALITIES

Economists Ian Ayres and Steven Levitt find that an auto antitheft device called Lojack produces large spillover benefits.

Private expenditures to reduce crime are estimated to be $30 billion annually and are growing at a faster rate than spending on public crime prevention. Unfortunately, some forms of private crime prevention simply redistribute crime rather than reduce it. For example, car alarm systems that have red blinking warning lights may simply divert professional auto thieves to vehicles that do not have such lights and alarms. The owner of a car with such an alarm system benefits through the reduced likelihood of theft but imposes a cost on other car owners who do not have such alarms. Their cars are more likely to be targeted by thieves because other cars have visible security systems.

Some private crime prevention measures, however, actually reduce crime, rather than simply redistribute it. One such measure is installation of a Lojack (or some similar) car retrieval system. Lojack is a tiny radio transmitter that is hidden within one of many possible places within the car. When an owner reports a stolen car, the police can remotely activate the transmitter. Police can then determine its precise location and track its subsequent movements.

The owner of the car benefits because the 95 percent retrieval rate on cars with the Lojack system is higher than the 60 percent retrieval rate for cars without the system. But, according to a study by Ayres and Levitt, the benefit to the car owner is only 10 percent of the total benefit. Ninety percent of the total benefit is external; it is a spillover benefit to other car owners in the community.

There are two sources of this positive externality. First, the presence of the Lojack device sometimes enables police to intercept the car while the thief is still driving it. For example, in California the arrest rate for cars with Lojack was three times greater than for cars without it. The arrest puts the car thief out of commission for a time and thus reduces subsequent car thefts in the community. Second, and far more important, the device enables police to trace cars to chop-shops where crooks disassemble cars for resale of the parts. When police raid the chop-shop, they put the entire theft ring out of business. In Los Angeles alone, Lojack has eliminated 45 chop-shops in just a few years. The purging of the chop-shop and theft ring reduces auto theft in the community. So, auto owners who do not have Lojack devices in their cars benefit from car owners who do. Ayres and Levitt estimate the *marginal social benefit* of Lojack—the marginal benefit to the Lojack car owner *plus* the spillover benefit to other car owners—is 15 times greater than the marginal cost of the device.

We saw in Figure 18-4(a) that the existence of positive externalities causes an insufficient quantity of a product and thus an underallocation of scarce resources to its production. The two general ways to correct the outcome are to subsidize the consumer, as shown in Figure 18-4(b) or to subsidize the producer, as shown in Figure 18-4(c). Currently, there is only one form of government intervention in place: provincial-mandated insurance discounts for people who install auto retrieval systems such as Lojack. Those discounts on insurance premiums, in effect, subsidize the consumer by lowering the price of the system to consumers: the lower price raises the number of systems installed. But based on their research, Ayres and Levitt contend that the current levels of insurance discounts are far too small to correct the underallocation that results from the positive externalities created by Lojack.

Source: Based on Ian Ayres and Steven D. Levitt, "Measuring Positive Externalities from Unobservable Victim Precaution: An Empirical Analysis of Lojack," *Quarterly Journal of Economics*, February 1998, pp. 43–77. The authors point out that Lojack did not fund their work in any way nor do they have any financial stake in Lojack.

CHAPTER SUMMARY

1. Graphically, the collective demand curve for a particular public good can be found by summing vertically the individual demand curves for that good. The demand curve resulting from this process indicates the collective willingness to pay for the last unit of any given amount of the public good.
2. The optimal quantity of a public good occurs where the combined willingness to pay for the last unit—the marginal benefit of the good—equals the good's marginal cost.
3. Cost–benefit analysis can provide guidance as to the economic desirability and most efficient scope of public goods output.
4. Spillovers or externalities cause the equilibrium output of certain goods to vary from the optimal output. Spillover costs (negative externalities) result in an overallocation of resources that can be corrected by legislation or specific taxes. Spillover benefits (positive externalities) are accompanied by an underallocation of resources that can be corrected by subsidies to consumers, subsidies to producers, or government provision.
5. According to the Coase theorem, private bargaining is capable of solving potential externality problems where (a) the property rights are clearly defined, (b) the number of people involved is small, and (c) bargaining costs are negligible.
6. Clearly established property rights and liability rules permit some spillover costs to be prevented or remedied through private lawsuits. Lawsuits, however, can be costly, time-consuming, and uncertain as to their results.
7. Direct controls and specific taxes can improve resource allocation in situations where negative externalities affect many people and community resources. Both direct controls (e.g., smokestack emission standards) and specific taxes (e.g., taxes on firms producing toxic chemicals) increase production costs and hence product price. As product price rises, the externality is reduced, because less of the output is bought and sold.
8. Markets for pollution rights, where firms can buy and sell the right to discharge a fixed amount of pollution, put a price on pollution and encourage firms to reduce or eliminate it.
9. The socially optimal amount of externality abatement occurs where society's marginal cost and marginal benefit of reducing the

externality are equal. This optimal amount of pollution abatement is likely to be less than a 100 percent reduction. Changes in technology or changes in society's attitudes toward pollution can affect the optimal amount of pollution abatement.

10. The law of conservation of matter and energy is at the heart of the pollution problem. Matter can be transformed into other matter or into energy but cannot disappear. If not recycled, all production will ultimately end up as waste. Recycling is a recent response to the growing garbage disposal problem. The equilibrium price and quantity of recyclable inputs depend on their demand and supply. The government can encourage recycling through either demand or supply incentives.

11. The global warming problem is caused by excessive accumulation of carbon dioxide and other greenhouse gases in the earth's atmosphere. In the Kyoto Protocol of 1997 the world's nations agreed to reduce their emissions of greenhouse gases to 6 to 8 percent below 1990 levels by 2012.

12. Asymmetric information between sellers and buyers can cause markets to fail. The moral hazard problem occurs when people alter their behaviour after they sign a contract, imposing costs on the other party. The adverse selection problem occurs when one party to a contract takes advantage of the other party's inadequate information, resulting in an unanticipated loss to the latter party.

TERMS AND CONCEPTS

cost–benefit analysis, p. 459
marginal cost = marginal benefit (MC = MB) rule, p. 461
externalities, p. 461
Coase theorem, p. 462
tragedy of the commons, p. 466
market for externality rights, p. 467
optimal reduction of an externality, p. 470
law of conservation of matter and energy, p. 470
asymmetric information, p. 474
moral hazard problem, p. 476
adverse selection problem, p. 477

STUDY QUESTIONS

1. **KEY QUESTION** Based on the following three individual demand schedules for a particular good, and assuming these three people are the only ones in the society, determine (a) the market demand schedule on the assumption that the good is a private good, and (b) the collective demand schedule on the assumption that the good is a public good. Explain the differences, if any, in your schedules.

Individual 1		**Individual 2**		**Individual 3**	
P	Q_d	***P***	Q_d	***P***	Q_d
$8	0	$8	1	$8	0
7	0	7	2	7	0
6	0	6	3	6	1
5	1	5	4	5	2
4	2	4	5	4	3
3	3	3	6	3	4
2	4	2	7	2	5
1	5	1	8	1	6

2. **KEY QUESTION** Use your demand schedule for a public good, determined in question 1, and the following supply schedule to ascertain the optimal quantity of this public good. Why is this the optimal quantity?

P	Q_s
$19	10
16	8
13	6
10	4
7	2
4	1

3. **KEY QUESTION** The following table shows the total costs and total benefits in billions for four different antipollution programs of increasing scope. Which program should be undertaken? Why?

Program	Total cost	Total benefit
A	$ 3	$ 7
B	7	12
C	12	16
D	18	19

4. **KEY QUESTION** Why are spillover costs and spillover benefits also called negative and positive externalities? Show graphically how a tax can correct for a spillover cost and how a subsidy to producers can correct for a spillover benefit. How does a subsidy to consumers differ from a subsidy to producers in correcting for a spillover benefit?

5. An apple grower's orchard provides nectar to a neighbour's bees, while the beekeeper's bees help the apple grower by pollinating the apple blossoms. Use Figure 18-2(b) to explain why this situation might lead to an underallocation of resources to apple growing and to beekeeping. How might this underallocation get resolved via the means suggested by the Coase theorem?

6. Explain: "Without a market for pollution rights, dumping pollutants into the air or water is costless; in the presence of the right to buy and sell pollution rights, dumping pollution creates an opportunity cost for the polluter." What is the significance of this opportunity cost to the search for better technology to reduce pollution?

7. **KEY QUESTION** Explain the following statement using the MB curve in Figure 18-6 to illustrate: "The optimal amount of pollution abatement for some substances, say, water from storm drains, is very low; the optimal amount of abatement for other substances, say, cyanide poison, is close to 100 percent."

8. Relate the law of conservation of matter and energy to (a) the air-pollution problem and (b) the solid-waste disposal problem. What is the tragedy of the commons, as it relates to pollution?

9. What is the global-warming problem? How is it being addressed? Using an example other than those given in the text, explain how global warming might hurt one particular region or country but help another.

10. Explain how marketable emission credits add to overall economic efficiency, compared to across-the-board limitations on maximum discharges of air pollutants by firms.

11. Explain why there may be insufficient recycling of products when the externalities associated with landfills and garbage incinerators are not considered. What demand and supply incentives might the government provide to promote more recycling? Explain how there could be too much recycling in some situations.

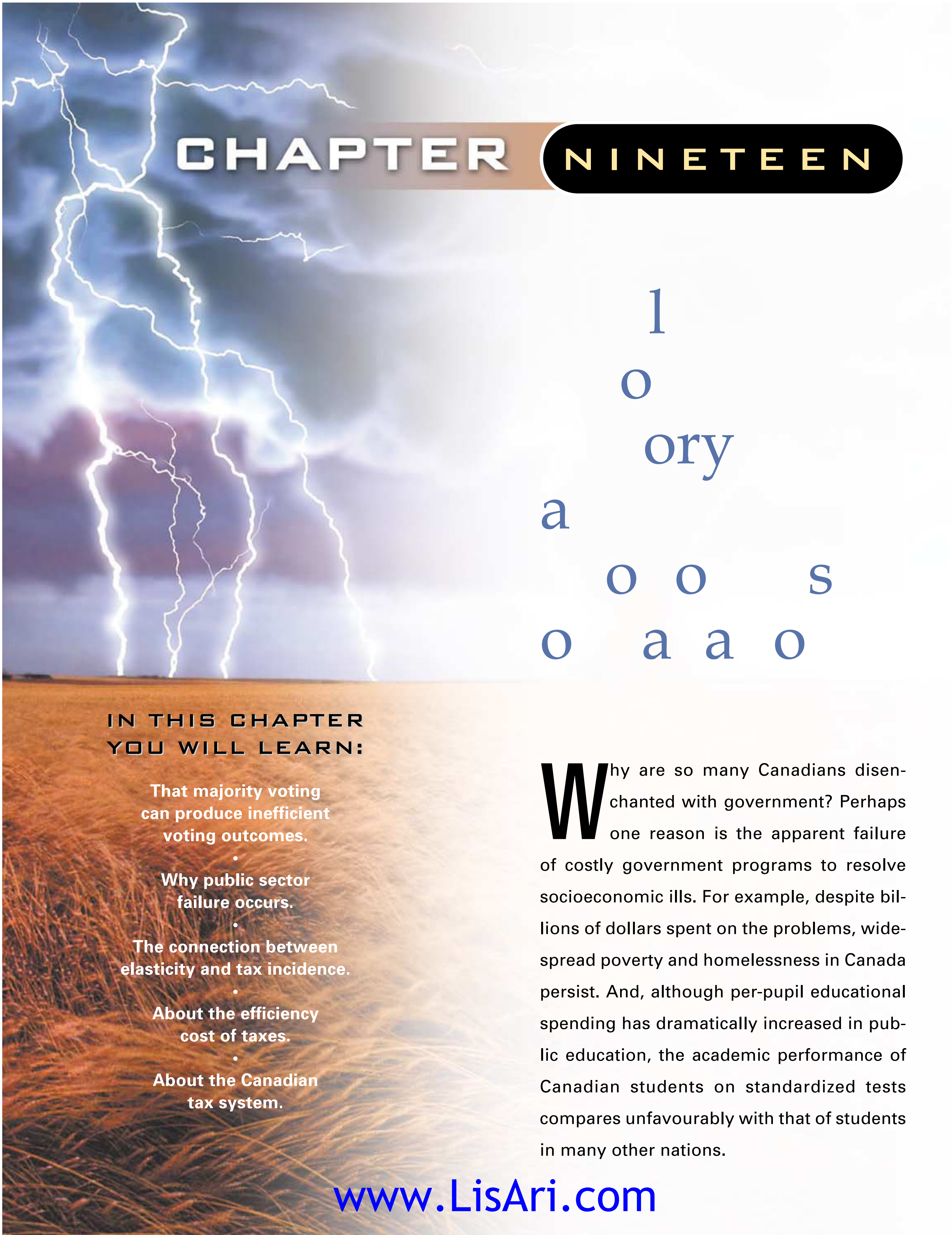
12. Why is it in the interest of new homebuyers and builders of new homes to have government building codes and building inspectors?

13. **KEY QUESTION** Place an M beside those items in the following list that describe a moral hazard problem and an A beside those that describe an adverse selection problem.
    - **a.** A person with a terminal illness buys several life insurance policies through the mail.
    - **b.** A person drives carelessly because he or she has automobile insurance.
    - **c.** A person who intends to torch his warehouse takes out a large fire insurance policy.
    - **d.** A professional athlete who has a guaranteed contract fails to stay in shape during the off-season.
    - **e.** A woman who anticipates having a large family takes a job with a firm that offers exceptional childcare benefits.

14. **(The Last Word)** Explain how a global positioning antitheft device installed by one car owner can produce a positive spillover to thousands of others in a city.

INTERNET APPLICATION QUESTION

1. Government can use direct controls in the form of legislation to reduce negative externalities such as water pollution. Environment Canada, <www.ec.gc.ca/envpriorities/cleanwater_e.htm>, is responsible for getting environmental results on clean water. What success has Environment Canada had? What is it doing now?



CHAPTER NINETEEN

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IN THIS CHAPTER YOU WILL LEARN:

That majority voting can produce inefficient voting outcomes.

•

Why public sector failure occurs.

•

The connection between elasticity and tax incidence.

•

About the efficiency cost of taxes.

•

About the Canadian tax system.

Why are so many Canadians disenchanted with government? Perhaps one reason is the apparent failure of costly government programs to resolve socioeconomic ills. For example, despite billions of dollars spent on the problems, widespread poverty and homelessness in Canada persist. And, although per-pupil educational spending has dramatically increased in public education, the academic performance of Canadian students on standardized tests compares unfavourably with that of students in many other nations.

r s ar a o r a s ar o o a r or a l r a ra y ro s r al r la o s a r a l a o o or a o sol ro ra s s r a ar o s a s or a ross r os s a s - al r s ro s s ro or o a ly arl a ’s s o s a so o . s as r ar *ma ke fail e* a o o y r a s - or, o l s r ar *go e nmen fail e* a o o y l s or. s a r a so o os s. r o a o s ar (1) l o ory o o a alys s o o r - s o a a (2) o o so a a o . a r a r s- ss o o o s r a a l ral s a so o r a o o r o .

REVEALING PREFERENCES THROUGH MAJORITY VOTING

l oo s s o l o r ro a a a o s o s o l a r o a o r a or o s o s l s ar a oll ly a a a ro a o ra ro ss a r l s a ly o a or y o . a a s or o o r al r a ol y a a s, a s l o l y ll a s so s o r oll al . o rs r r o als o o o a a ly r r s r oll s s. s also r o ally a o or s a ro al a al l ls o o r ly o l r s or l sla o .

l o o ra ro ss o s a r aso a ly oo o o r al so - y’s r r s, s r . **Public choice theory** o s ra s a a or y o a ro s a o s s s.

PUBLIC CHOICE THEORY The economic analysis of collective and government decision making.

Inefficient Voting Outcomes

o y’s ll- s a o r ro s a l oo os o al s s o al os . or a ly, a or y o o s o al ays ro a o o . o rs ay a a ro osal o ro a l oo o ay y l o al s a s o al os . o rs ly, a or y o - ay r s l ro s o o a l oo a os s or a s y l s.

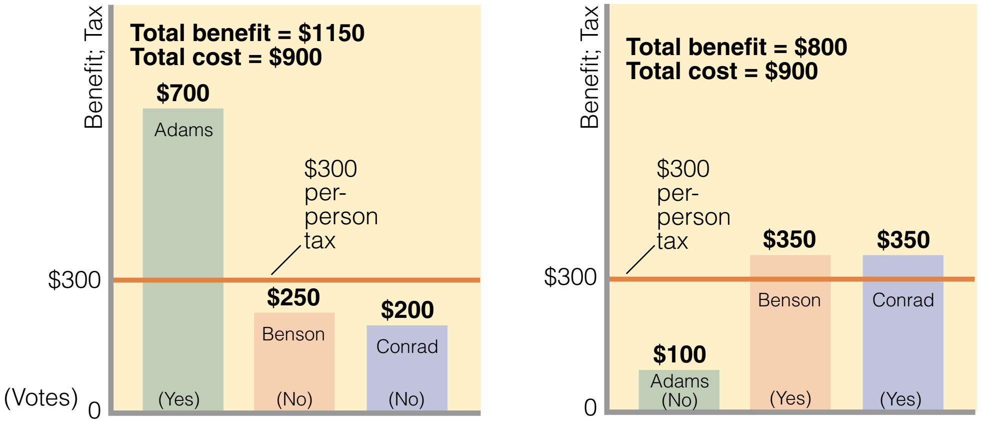
ILLUSTRATION: INEFFICIENT “NO” VOTE

ss a o r a ro a l oo , say, a o al , a a o al s o $ 00. ss a r ar o ly r als a s, - so , a o ra so y a a y ll s ar $ 00 a s ally, a a $ 00 ro os l oo s ro . ass , as r 1 -1(a) ll s ra s, a a s o l r $ 00 or o s ro a s l oo so , $2 0 a o ra , $200.

a ll r s l a a or y o r s r s l oo s ro l o o l o o al ays o s r ly a or o r o o- o r s , s l ly a so a o ra ll o o a s y ll r a os s o $ 00 a l a s o o ly $2 0 a $200, r s - ly. a s ll o y s. o a or y o ll a ro osal o o al o $11 0 ($ 00 or a s + $2 0 or so + $200 or o ra) s o al os o $ 00. so r s s o l o o s oo , y ll o , a r ll oo l l o s l oo .

FIGURE 19-1 INEFFICIENT VOTING OUTCOMES

Majority voting can produce inefficient decisions. Panel (a): Majority voting leads to rejection of a public good that would entail a greater total benefit than total cost. Panel (b): Majority voting results in acceptance of a public good that has a higher total cost than total benefit.



(a) Inefficient majority "no" vote

(b) Inefficient majority "yes" vote

ILLUSTRATION: INEFFICIENT “YES” VOTE

o o s r a s a o a or y a o rs a l oo o s
o al os *e ceed* s o al . r 1 -1( ) s o s a ls. a , a s, -
so , a o ra ll ally s ar $ 00 os o l oo y ll a
a $ 00. s a s’s o s o ly $100 ro l oo , s ll
o a a s . a l , so a o ra ll y $ 0 a . y ll o
or l oo a s a ($ 0) s r a ay s ($ 00).
a or y o ll ro a l oo os $ 00 a ro s o al s o
o ly $ 00 ($100 or a s + $ 0 or so + $ 0 or o ra). o y’s r so r s
ll ly allo a o s l oo , a r ll oo o .

CONCLUSION

o o ay o r as r a o r ro o or a r ro -
o o a s l oo a , r or , as a o rallo a o or rallo a o
o r so r s or a ar lar s . a r 1 sa a o r a
ro o o y y ro l oo s a ar sys ll
o a a a la l . o a a a alys s o r al a o r
a l o ro so l oo s os ro o s o o ally s -
a l l ro o r oo s a ar o o o ally arra .
o r a l s, a rso as o ly a s l o , o a r o or
s a or los ro a l oo . rs a l (o o),
a s o l ll o r as a o ro r so or o ra y-
o s r l al. a ay a s o l ass r o o a a o al
s so ly al s. s y o s s ll al, a y o l
s ro r r s or r a l oo s ay a o o o .
al o s rs a a s ro r r or a s *i a e good,*
y s ally a a oo ar la o ay o -
lar a or y o o s rs. o s r a y o , l r, a
s so s r ar s, al o s o l a s ro s o l
a a la l a or y o s o s l s. a rso a o as ly y a
blic good s as a o al o a or y as a a s .

o rs ly, a o s r ar la a o o y a ar lar ro , a o lar o . al o yo ay o a a o al , yo s y ro yo r a ay s s a o r y a or y.

Beca e majo i o ing fail o inco o a e he eng h of he efe ence of he indi- id al o e , i ma od ce economicall inef cien o come .

Interest Groups and Logrolling

s o s or r sol s asso a a or y o . o a l s ollo .

INTEREST GROUPS

os o a a s ro r r or a l oo ay a o r o a r s ro a s a r s s, a l s, a r rs as o o o o rs o r s o a l oo . a s ry o rs a so a o ra a s r s r s o o or a o al a a o al s or al a l o a r $2 0 a $200 al a o s. a als ar o o o ra ol s. o s y ar s ss l so - s y ar o .

POLITICAL LOGROLLING

LOGROLLING The trading of votes by legislators to secure favourable outcomes on decisions concerning the provision of public goods and quasipublic goods.

Logrolling ra o o s o s r a o ra l o o s a also r a o o o a o . o r rs a l r 1 -1(a) , r- a s so as a s ro r r or a r l oo , or a l , a roa , a s a o ra o o s or a s . a o l ro a o or y or a s a so o ra o s o s r ro s o o o a o al a roa . a s, a s a so o l a o y s o o as r s. a s o l a o al a so o l roa . o lo roll , o l oo s o l a r . o roll ll a o so y's ll- , as as r or a o al , roa r a s a r a r o rall a os . o roll o r as o o y. a o al a roa a os or a o al y ro , o s ll ro- a s o o ra . a s a so s ll a lo roll a s o s r a s a ro r or s a o r l oo , o a s o l o a l ar s o o ra . o roll s ry o o ro al l sla r s a arl a . a r r as or s o o y, o r s a s.

Paradox of Voting

PARADOX OF VOTING A situation in which paired-choice voting by majority rule fails to provide a consistent ranking of society's preferences for public goods or services.

o r l y a or y o s **paradox of voting**, a s a o so y ay o a l o ra s r r s o s s ly ro a r - o a or y o .

PREFERENCES

<www.magnolia.net/~leonf/sd/vp-brf.html>
The voter's paradox

o s r a l 1 -1, a a ass a o yo r o rs a s, so , a o ra . os o y as r al r a l oo s ro o oos a o al , a roa , a a s r - a r ar sys- . a a r o o y r rs r al r a s a r a or r. or a l , o rso r r a o al o a roa , a a roa o a s r - a r ar sys . a a o r r r-

TABLE 19-1 PARADOX OF VOTING

	Preferences		
Public Good	**Adams**	**Benson**	**Conrad**
National defence	1st choice	3rd choice	2nd choice
Road	2nd choice	1st choice	3rd choice
Severe-weather warning system	3rd choice	2nd choice	1st choice

Election	**Voting outcomes: winner**
1. National defence vs. road	National defence (preferred by Adams and Conrad)
2. Road vs. warning system	Road (preferred by Adams and Benson)
3. National defence vs. warning system	Warning system (preferred by Benson and Conrad)

s o o y ro a r - o a or y o . ally, a o a l a y o o l oo s, a r o a o a a a a s r l oo a o r o . r oo s a ass al r r s o r o rs ar l s o ar o a l 1 -1. a a a a a s r rs a o al o roa a roa o s r - a r ar sys . s l s also a a s r rs a o al o s r - a r ar sys . so al s roa or a s r - a r ar sys a ar sys- or a a o al . o ra 's or r o r r s s r - a r ar sys- , a o al , a roa .

VOTING OUTCOMES

lo r ar o a l 1 -1 s o s o - o s o r y o al s o s o a or y o . rs , a o al s a a s roa a s a a or y o o rs (a s a o ra) r r a o al o roa . s o l o os r s o y a s a roa or a s r - a r ar sys , a a or y o o rs (a s a so) r r roa . a r a a or y o o l s o y r r a o al o a roa a r r a roa o a s r - a r ar sys . s s lo al o o l a o y r rs a o al o a a r ar sys , o y o s o !

o o s ra s o l s o , ol a r l o a o al a ar sys . o ( ) s o s a a a or y o o rs (so a o ra) r r s r - a r ar sys o a o al . s l s a l 1 -1, , r a r - o a or y o s ly a s o y s rra o al s s o r r a o al o a roa a a roa o a ar sys- , o l ra r a a s r - a r ar sys a a o al .

ro l s o rra o al o y r r s ra r a a ro - r or r os r r s. s a o o ro a r - o a or y o ay o or r o s ar a . r so r s a s a or y o a ls o a o s s o s a r o y's rly r r s. s a o s , o r ay l o ro orr l oo s y a a or a a or y o . or a o s r s o a o s s a r s so r ro r . a or y o s or l ly o r o - y r r s a s o s a y, say, a a or or a ro o s l - a o l a rs. (*Key Question 2*)

MEDIAN-VOTER MODEL The theory that under majority rule the median (middle) voter will be in the dominant position to determine the outcome of an election.

Median-Voter Model

al as o a or y o r als s s o r al- orl o a. **median-voter model** s s s a , r a or y r l a o s s o r r s, a o r ll a s s r o o s o l o s. a o r s rso ol l os o o a ss al o r o rs a s ro r r r s or a l oo , a o o a a o , or r o o r r la o , a al a a r or a r r s. r o rs o a s o a ss r r a o ra r a o r r os o , so a o r's o r o a s.

EXAMPLE

os a so y o os o a s, so , a o ra as r a a r a as a so y s a s r - a r ar sys . a ly s o s a o al ollar a o or s s s o l s o ar sys , ass a ll a o - r o a a o . l o ll r s o sys . a s a rso a o o or s or r o ro-osal, o a or y ll o r all ro osals ar la o allo a sa . s, ro s o a a r - o o y ll rs o o o ro osals a a r o a o a a s r a ro osal. r ro osals ar as ollo s a s s r s a $ 00 sys so a s a $ 00 sys o ra o s or a $ 00 sys . ro osal ll a - o r o l s s s ll $ 00 ro osal s y a o r, a s. al o r o rs a o r a or os ly sys al a o r a l ss os ly sys . o r-s a y $ 00 sys ll o o , l 's o o l o s. rs , s os a $ 00 ro osal s a a a s $ 00 ro osal. a s a rally o s or r $ 00 ro osal, a so o s or s o $ 00 ro osal. o ra , o ro os $ 00 r or ar sys , o s or $ 00 ro osal a s s los r o s o . o a s's $ 00 ro osal s s l y a 2- o-1 a or y o .

, a $ 00 ro osal a a s $ 00 ro osal. a $ 00 ro-osal s. s a o ro a s a o ro so , o ro os $ 00 r a or a r aso r rs a $ 00 r o a $ 00 o . a s, a o r s as , s a s s rso o as l l o r o a s r - a r ar sys or s so y.

REAL-WORLD APPLICABILITY

l o o r ll s ra o s a s l o , la s a r a al. o o a - y or l o s o a os los ly a . ol al a - a s, or a l , a o s o os o s o o a o o r ol al ar s so o , y o a al o a o r r ar y o o a o . y s r s or los ly o ol al r y s ar o a a s o o s ro o os ol al ar y. , y r r r a al o ar a o r o al o la o . y also ry o la l r o o s as oo l ral, or oo o s r a , a o o o a s r a a a a. y o olls a a s r os o s o ss s a or ly.

IMPLICATIONS

a - o r o l as o or a l a o s

1. a y o l ll ssa s y o o r ol o o y. s o o r ll lar ly r y a r - r , l a a y o l s r a lar r, or a s all r, l s or. ar la yo a y ro s, o s, or 200 -

s, o o yo oy . l s or yo r o r ro al ays a o r r rs.

2. o o l ay o r y o o ol al r s o s r a o r's r r s ar los r o r o . y ay o ro y o a s r r l l o o r s r s, a r or a s, s lo r. r y ay o o a ar a o or s ll , - s , s ool sys .

or s r aso s, a a s o r rso al r r s or o r a y ar o s a , a r r s so r . or o r, or a o a o o- l 's r r s s r , l a roo or ol a s o s r a os o . y o, y ay a a l r - l . (*Key Question 3*)

GOVERNMENT FAILURE

GOVERNMENT FAILURE Inefficiencies in resource allocation caused by problems in the operation of the public sector (government).

a s a o o r s l s o ar la ar o al ays sa s a - ory a a o r a o s a l orr . o o s s a r a o- r as a l a o al s a s o ar a l r . y a o a s o os a alys s o a s o s, l ro- s o o l oo s a s r s, a s s or s r a r al s, ro- s o s o a ro r a ar or a o , a so o . as l o r s ss o o o ro l s, o r o s o al ays r or s o o o s ly a ly. l o ory r als a r s or o s l s or a ro o o s. s or o s ay r s l **government failure** y a s o r a ara r s s o l s or. 's o s r so o s ara r s s a o o s.

Special Interests and Rent Seeking

as al r o s s s r ay a s a a so o o s a oo ol s. o o o s alls or l s or o rs ar o s ro- ra s as lo as ar al s ar al os s. Goo ol s, o r, s s s a ol a s s or ro ra s a ol s a ll a r a o l a s ay o . r s l ay a o - r ll ro o oals o ro s o o rs a a s al r s s o r o lar r l . ro ss, o o y ay r s l .

SPECIAL-INTEREST EFFECT

SPECIAL-INTEREST EFFECT Any result of government promotion of the interests (goals) of a small group at the expense of a much larger group.

l s o a s o a r y **special-interest effect**. s s a y o o o ol al ro ss r y a s all r o o l o a a o r ro ra or ol y a s lar a s a s o a r a r r o rso s o ally s r s all loss s. s all ro o o al ar s s ll or a ly o al o ss s o , a y r ss ol a s or a ro al. lar rs a - ry s all al loss s, o r, ar rally or o ss . ol a s l y ll los a a o r o s a o s o s all s al- r s ro a a s ss y l sla a a s ll o los s or o lar ro o or o rs, o ar l ly o al a ol a s o o r ss s o r a r or a o .

s al- r s s also so- all *o k-ba el oli ic* , a a s o s r a o r ro a y l s s a ly o a s l ol al s r a s ol al r r s a . s as , s al- r s ro o r s s al o s s, l lar r ro o s s s o r la ly or a - ay rs s a r a ross a lar r o ra ar a. ol a s l arly a a s ro o s r l oo s (or) or r al o s s. oo s ol al a o r a s y ar ly al y o s s a lar r ro o r la ly or a ay rs ars os . or o r, lo roll y ally rs r . o or y s al al ro a ll o or yo rs o s ar o o rall s ra y or s r or a r a l . ally, a ol a ’s l a o os or s all r ro o s al - ar s s a a s s al- r s ro s ar o ll o l a a a s o r - ol a s a ol a s o r o or . r s l s a ol a s ay s or s al- r s ro ra s a ro s a a o s o o o ro s.

RENT-SEEKING BEHAVIOUR

RENT-SEEKING BEHAVIOUR The actions by persons, firms, or unions to gain special benefits from government at the taxpayers’ or someone else’s expense.

a al o o r or s al s a a ay rs’ or so o ls ’s s s all **rent seeking**. o o o s s, r s a ay yo a s - ssary o a r so r s l s rr s . or ora o s, ra asso a- o s, la o r o s, a ro ss o al or a a o s loy as r so r s o s r a o ra l o r ol s a r s l r r ro or o a o l o r r o ar o o s. o r s a l o s- s s r r ly or r ly ro la s, r l s, r , a r as s. l o als ar ll o ro s r a s y a o r s o s o y o s s, o r l r a o . r ar so a l s o r - ro l sla o or ol s ar s o or- ro s a l o o a ra s r s o o s rs a r a s a s or ora o s o r o s r o ro s a r a o o s os or a s y y l o a o al l s a o s yo a s o ro o s rs a lar s s s o ar rs y a - ay rs. o o s s s y o o y.

Clear Benefits, Hidden Costs

o r s say a o -s ol a s ll o o ly all os s a s o ar o s ro ra s, as o o ra o al y a s, o s or a o r . a s ol al o ol rs s s o r s or ry y ars, y a o r ro ra s a a a a l ar- s a a or rr os s. o rs ly, ol a s ll r ro ra s a a as ly a l os s l ss as ra l a ry lo - r s. as s ay l a ol a s o r o o ally s a l ro ra s a o a ro ra s a ar o o ally rra o al. or a l , a ro osal o o - s r or a ass- ra s sys s lar ro ol a ar as ay o o - ally ra o al o as s o os a alys s, (1) ro ra s o a y a r as s ly s l o or sal s a s a (2) - s ll o r o ly y ars ro o ro s o l , o - s ol a ay o os ro ra .

o rs ly, ass a a ro ra o ral ra s rs o al ol or s s o s a l o as s o os a alys s. os s a or ro s r l s s, ro ra ’s o s s ays so lar a ll a a ro al.

Limited and Bundled Choice

l o or s s o o a ol al ro ss or s s a r
l r r s a s o l ss s l oos l oo s a s r s
a y ar oos r a oo s a s r s.
ar la , as a o s r a a ly sa s y rso al r r-
s y y r a oo sa o y o rs. o r, l s or
as a o r s o ro , say, o ly o or r a a s or a o , a
r r s a r l o ro ra s (l oo s a s r s). o o s
l s o l oo s s l ly o a ly r r s o a y ar lar o r,
y o r s oos o o . a a o o s los s o o r
’s r r ay ors a o al al s ra , r as s l -
r y s, s s s o o a o ar rs, a ar s o or oo s. s
l ly o o or a a a o s ro ly o os s o a os s s.
o r or s, o r s a a oo . l s or,
o l ar or o y oo s a s r s y o o a . s as , o
o a s or - oo s s or , yo r or o y a a ool o a
a a ro r s o s. s s as a o r r so r s ar o s
ly o sa s y o s r a s. s s s , ro s o o l oo s
a s r s s r ly .
arl a s o ro a s lar l - o , l - oo s ro l .
ro r a o s l sla o o s r s, o sa s, o s s
o a s l ll. a y o s s s ay o l ly r la o
a r os o l sla o , y rs o arl a s o r
a a y a or ay. l o s rs ar la , y a o s l -
. (***Key Question 4***)

Bureaucracy and Inefficiency

o o o s s o a l a s ar rally l ss a r -
a s ss s. r aso s o a la y a o or rs so o
l s or l a o s a a a l o l ra a o r a
s or. a r, s a ar sys r a s s a r ss r s or r-
al y a ar a s ro l s or. r a r r s s a a l ar
oal ro . ra r a r s a o or o o ol s ar , -
a a a s lo r os s a r ro . r ro o o ly
s r ’s o rs a s ro o o ros s o a a rs. ar
o a a rs’ ay ay o ro a ro -s ar la s, o s s, a
s o o o s. r s o s lar a o o r a s a r a -
a rs o o r ar o ro o r a a s ro o a y.
ar sys os sa ry o o s s o r or a o r a r s
s o ro a loss. r s ro a l a r or s ss l
s r s, ros rs, a ro s. r s ro a l a s ss l
l s a o s a r a as s o s . o s lar, l ar-
s s s o ass ss y or y o l a s. o
a a yo r r a l y ro l r y ro r, a ro ally
rs y, a al r ar , ar o r l r , or
r a o a a rs s o ra ly
y s ar a a l a y a ly s s s r so r s s l ly
os r a ro ! r a s or, y a o ary loss l a o
a a o o r a a s, ro s, or r s. o r , y
say, o s o l o a a o a s as a l . o s s a

y al r s o s o o r o a ro ra ’s a l r s o r as s a s a , a s a l s or y s o s o a lar r s al . r r or , o o s s ass r a o r loy s, o r s al- r s ro s y s r , o a s ol al lo o lo a s o ar o or l a ra s. ol a s o a or s o ral r a ra s s as os r la o a r l r , a- o , al a l ar , a a o al r s a l ol al r s a s r a ra s a s al- r s ro s ll a o a .

ally, r s o o a r s a y or o r r a ra s o s y r o loy y loo or a ally ro l s o sol . s o s r r s a so al ro l s, as y o- r , o rs s or a .

Imperfect Institutions

s oss l o ar a s r s s o l s or y ar a r- a a y al. r a s y ar . r l ss, y o o s a r o o a ol o r a r s o s r s o a y o a s o s s. ar sys o r a s or s ar ro r ly , a o r ’s o o o s a ly o orr a sys ’s s or o - s. l s or oo s s o s l ll s o o - o . r l a o ar so s o r ar s a r o r s, or a l y ar s a all- o , ra o al, ol o r s, a ly r s o s.[1]

a s ar sys a l a s ar o r , s so - s l o r r a ar lar a y a r or r a r s ss r a s or or l s or. s asy or a a r o o os r s a o al s l l s or, l o - r ro o a s a o l s y r a s or. a a o al s ra ar s a r r a o ar as r ro o ar a oll o o s a o s ar o ass ss ry oo or s r a o say a sol ly a s o l ass o r l s or or r a s or. r all, oo s a s r s s o ar ro ar y *bo h* r a r- r s s a l a s.

QUICK REVIEW

- Majority voting can produce voting outcomes that are inefficient; projects having greater total benefits than total costs may be defeated and projects having greater total costs than total benefits may be approved.
- The paradox of voting occurs when voting by majority rule does not provide a consistent ranking of society’s preferences for public goods and services.
- The median-voter model suggests that under majority rule and consistent voting preferences, the voter who has the middle preference will determine the outcome of an election.
- Public sector failure allegedly occurs as a result of rent-seeking, pressure by special-interest groups, shortsighted political behaviour, limited and bundled choices, and bureaucratic inefficiency.

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[1] Otto Eckstein, *Public Finance*, 3rd ed. (Englewood Cliffs, N.J.: Prentice-Hall, 1973), p. 17.

APPORTIONING THE TAX BURDEN

The Role of Governments

o r ro l so a oll so sa o l oo s o l so o os oo ss o l a . s l o as r r s ly o so l oo s ar a oro a o als a s o s. a o a ra ly r o a s ro l ary s alla o s, a or o - ays, a l s ool sys , a o al a r ra , a al ol a r ro o . s a o s r o s o ay or os s. s r al r aso a l lar y o o rall a r s a or o . (y a r a o al os o a s os o so y.) s a or o s o a s a o s. o rall l l o a s s or a , a ra s or o r s or r ar o o rall a r .

<n103dept.matc.edu/walshj/handouts/goodtax.htm>
Principles of a good tax

Benefits Received versus Ability to Pay

r ar o as loso s o o o o y's a r s o l a or o .

BENEFITS-RECEIVED PRINCIPLE

BENEFITS-RECEIVED PRINCIPLE The idea that those who receive the benefits of goods and services provided by government should pay the taxes required to finance them.

benefits-received principle o a a o ass r s a o s ol s a s ss s s o l r as oo s a s r s o o r sa ay y y o r o o s. os o os ro o r -s l oo s or s r ss o l ay a s ssary o a . l oo s ar o a o s as s. or a l , o y oll as asol a s s y ally s o a so ay o s r o a r a rs. s o l o ro oo roa s ay os o os roa s. l s a ly ar s , o - r, o s r s r a a l a o o s-r r l .

- o ll o r r s a al o s ol s a s ss s r ro a o al , a o , o r sys , a ol a r ro o all a l oo s ro s r a s llo r s a a l s o r l o s o a ly. s ly s ra or ar as o ay a , s l o as r s. rs o ars r r s ro oo roa s, o - rs also . or a l , s ss s a s oo roa s r s o rs.
- s-r r l a o lo ally a l o o r s r- o ro ra s. o l a s r a s l- a o as oor a l s o ay a s o a r l ar ay s. o l r lo s o o a o ly loy or rs o a loy o sa o ay s y r .

ABILITY-TO-PAY PRINCIPLE

ABILITY-TO-PAY PRINCIPLE The idea that those who have greater income (or wealth) should pay a greater proportion of it as taxes than those who have less income (or wealth).

ability-to-pay principle o a a o ass r s a a r s o l a or- o a or o a ay rs' o a al . a a a s a s a - als a s ss s lar r o ss o l ay or a s o a sol a r la r s a os s all r o s.

a s ra o al o a l y- o- ay a a o ro o s ar a a a - o al ollar o o r y a o s ol y l s a s all r a o o sa s a o or ar al l y s s . a s o s rs a ra o ally, rs ol-lars o o r a y r o ll s o - r y oo s a y l r a s ar al l y. ss ollars o o ll o or l ss r ly oo s a ally or r al oo s a s r s. s ro ss a s a a ollar a ro a s ro a oor rso o as ollars r r s s a r a r l y sa r a a ollar a ro a s ro a r rso o as a y ollars. o ala sa r s a a s os o o r rs, a s s o l a or o a or o a o o o a a ay r r s. s ar s a al , a l a o ro l s ar s r , oo. l o a r a o s ol ar $100,000 r y ar as a r a ra l y o ay a s a a o s ol r $10,000, o ′ o a ly o or a l y o ay rs a ly as. o l al r a ly ay sa *e cen age* o s lar r o , a a lar r a sol a o , as a s r s o l a o ay a lar r *f ac ion* o s o as a s o lar r s o l a ra o

r s o s ay o as r so o ′s a l y o ay a s a a ′s a ro l . ra , sol o s o ss or , a s o ol al ar y o r, y, a o r ly o r s r .

Progressive, Proportional, and Regressive Taxes

y s ss o o a a o l a s l a ly o s o o a ra s. o a a *a e age a a e s* o al a a y so as a a s a s o ar .

DEFINITIONS

PROGRESSIVE TAX A tax whose average tax rate increases as the taxpayer's income increases and decreases as the taxpayer's income decreases.

REGRESSIVE TAX A tax whose average tax rate decreases as the taxpayer's income increases and decreases as the taxpayer's income decreases.

PROPORTIONAL TAX A tax whose average tax rate remains constant as the taxpayer's income increases or decreases.

a s ar lass as ro r ss , ro or o al, or r r ss , o r la o s a ra a ra s a a ay r o s. o so o s a s all a s, r o o or o a ro or a l or a ar l o la , ar l a ly a o o so o ′s o .

- a s **progressive** s a ra ra r as s as o r as s. a a la s o o ly a lar r a sol (ollar) a o also a lar r r a o o as o r as s.
- a s **regressive** s a ra ra l s as o r as s. a a a s as all r ro or o o o as o r as s. r r ss a ay or ay o a a lar r a sol a o o o as o r as s. (o ay a o r a a l os s a a s o l s o .)
- a s **proportional** s a ra ra *emain he ame* r ar l ss o s o o .

a ll s ra s as rso al o a . os a ra s ar s a a o s ol ays 10 r o s o a s r ar l ss o s o s o . s s a *o o ional* o a . o s os ra s r r ss a a o s ol a a al a a l o o l ss a $10,000 ays r o a s a o s ol a o o $10,000 o $20,000 ays 10 r o a $20,000 o $ 0,000 o ays 1 r a so or . s s a *o-g e i e* o a .

ally, s os ra l s as a a l o r s s yo ay 1 r yo ar l ss a $10,000 10 r yo ar $10,000 o $20,000 r yo ar $20,000 o $ 0,000 a so or . s s a *eg e i e* o a .

TABLE 19-2 TAX REVENUE SOURCES OF CANADIAN GOVERNMENTS, 1997–98

	Billions of dollars	Percent of GDP
Personal income taxes	160.2	16.7
Corporation income taxes	33.9	3.5
Sales taxes	73.1	7.6
Property and related taxes	35.6	4.0
Other taxes	70.7	7.4
Total tax revenues	373.5	39.2

Source: a s s a a a, .s a a . a/ l s / / a /Go r / o 01a. , 1 . s . ra ll. a/ oll / o ll or a a a . Σ-STAT

ral, ro r ss a s ar os a all r la ly or a ly o os - o s r r ss a s ar os a all r la- ly or a ly o oor. (*Key Question 7*)

APPLICATIONS

's a ro r ss y, or r r ss y, o s ral a s. a l 1 -2 yo ll y l s o a a s a a a a a s y l s ar as a r a o ross o s- ro .

Personal Income Tax ral rso al - o a s ro r ss , ar al a ra s (os ass ss o a o al o) ra ro 1 o 2 r . 2000 ral - o a as 1 r o rs $ 0,00 2 r or o $ 0,00 a $ 0,00 a 2 r or o a o $ 0,00 . l s a allo als o ro o o r o s o r r s r r r- sa la ( ) o a a l ss ro r ss a s ar al ra s s s . r l ss, a ra a ra s r s o . a l 1 -2 s o s a rso al o a s y ar lar s so r o o r r .

Sales Taxes rs o , a ral sal s a , or a l , a r ra o l s o ro or o al, a s r r ss r s o o . lar r or o o a lo - o rso 's o s os o a a s as or a - o rso r ay o a o ar o o a s sa , r as oor ar a l o sa . or a l , o - o Gol s as a o o $1 ,000 a s s all. - o o s as a o o $ 00,000 s s o ly $200,000 a sa s r s . ss a r sal s a a l s o all r s o a al, a Gol s ays $ 0 (r o $1 ,000) sal s a s a o s ays $10,000 (r o $200,000). Gol - s ays $ 0/$1 ,000 or r o o as sal s a s, l o s ays $10,000/$ 00,000 or . r o o as sal s a . ral sal s a , r - or , s r r ss .

<sbinfocanada.about.com/aboutcanada/sbinfocanada/library/weekly/aa032101a.htm> Provincial tax comparison for small businesses

Corporate Income Tax ral or ora o a s ss ally a ro or o al a a a 2 r a ra 2000. s ass s a or ora o o rs (s ar ol rs) ar a . o a r s ar a a l as ar o a s ass ro o o s rs or o r ro r s. o a s o rs, a s l a sal s a a s s r r ss .

Property Taxes os o o s s o l a ro r y a s o l s ar r r ss or sa r aso s as ar sal s a s. rs , ro r y o rs a a o r s a a s ar ar . o , ro r y a s, as a r a o o , ar r or lo - o a l s a or - o a l s a s oor s s a lar r ro or o o r o s or o s . s all r r ss y o ro r y a s ay r as y r s ro r y- a ra s ro al y o al y. ral, ro r y- a ra s ar r oor r ar as o a or lo r ro r y al s.

TAX INCIDENCE AND EFFICIENCY LOSS

TAX INCIDENCE The person or group who ends up paying a tax.

r r a ar lar a s ro r ss , ro or o al, or r r ss s o l a , a s os o o a s ar l o o al ays ay a s. , r or , o ry o lo a al r s la o a a , or **tax incidence**. ools o las y o s ly a a ll l . 's o s o a y o- al s a l o ro rs. o ro rs r ally ay s a , or o y s o o s rs

Elasticity and Tax Incidence

r 1 -2, *S* a *D* r r s r a ar or a r a o s o- a l r r a a y ar $ r o l a 1 ll o o l s. - os a o r l s a s a o $1 r o l a ry. o ll a ally ay s a

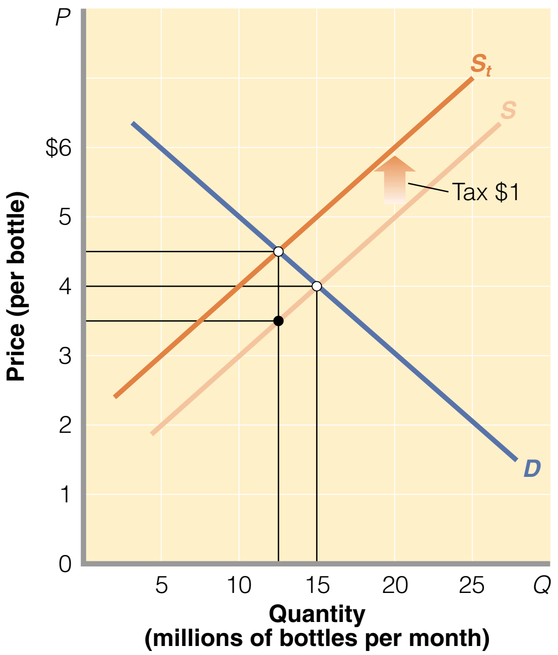
DIVISION OF BURDEN

o r os s a o s ll rs (s l rs), a a as a a o o ar al os o ro . o s ll rs s $1 or or a o l o r sa r- ro y r or a . l s ll rs ar ll o o r, or a l , ll o o l s o a a $2 r o l , y s o r $ r o l ($2 l s $1 a) o o r sa ll o o l s. a s s s ly r ar (l ar) as s o r 1 -2, r *S* s a r- a s ly r .

a r- a l r r s $. 0 r o l , r as or - a - l r r as $. o, s as , o s rs ay al $1 a as a r r

FIGURE 19-2

An excise tax of a specified amount, here $1 per unit, shifts the supply curve upward by the amount of the tax per unit: the vertical distance between S and S_t. This results in a higher price (here $4.50) to consumers and a lower after-tax price (here $3.50) to producers. Thus consumers and producers share the burden of the tax in some proportion (here equally at $.50 per unit).



ro rs ay o r al or o a lo r a r- a r- r . a
s, a r r $1 a r o o r , ro rs r $. 0, or 0
s l ss a $ or - a r . o, s as , o s rs a ro rs
s ar r o a ally ro rs s al a o o s rs
or o a r r a ar o r al s l s.
o also a l r a y l s a s o a l y a
r r a os s o o s rs. r 1 -2 a l a y s
ro 1 ll o o l s o 12. ll o o l s r o .

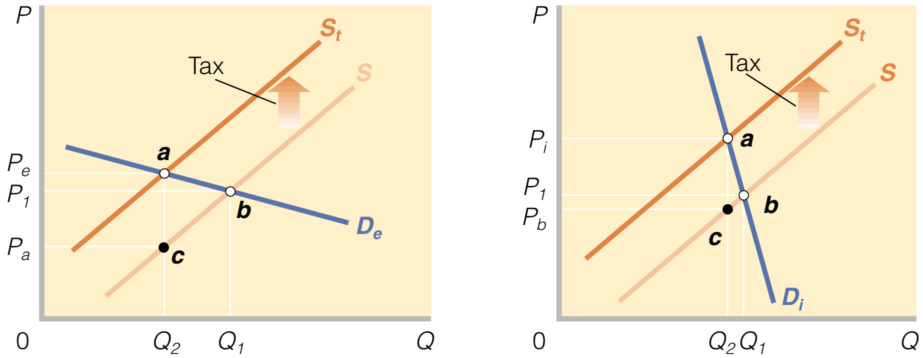
ELASTICITIES

las s o a a s ly r r ro os s o r
1 -2, o a o l also r . o ral a o s ar r l a .
rs , *i h a eci c l , he mo e inela ic he demand fo he od c , he la ge i*
he o ion of he a hif ed o con me . o r y s, s ra ally r
as s a s r ly las a r ly las . rs as ,
o a s r ly o s ll rs s o , a s s r ly
o o s rs.

r 1 - o ras s or s al as s r a s r r la ly las-
or r la ly las r l a r ra . las a a l (a),
a s all or o o a $(P_e \quad P_1)$ s s o o s rs, a os o a $(P_1 \quad P_a)$
s or y ro rs. las a a l ( ), os o a $(P_i \quad P_1)$
s s o o s rs, a o ly a s all a o $(P_1 \quad P_b)$ s a y ro rs. o
ra s r- a s r r s y r al s a *S* a *S*.
o also a l l r a y $(Q_1 \quad Q_2)$ s s all r
a s or las . s s as s o o r r o s a l a o s o las-
y o -s l sla r s la a y s a s o l or, -
ar s, a o o l r s, l o s r , a o r ro s os a s
o o las . a or s ro s s r la ly las ,
a o s o r sal s y , so a r s ays .
o , *i h a eci c demand, he mo e inela ic he l , he la ge i he o ion*
of he a bo ne b od ce . s ly s las r 1 - (a) , ro rs

FIGURE 19-3

Panel (a): If demand is elastic in the relevant price range, price rises modestly (P_1 to P_e) when an excise tax is levied. Hence, the producer bears most of the tax burden. Panel (b): If demand is inelastic, the price to the buyer increases substantially (P_1 to P_i) and most of the tax is shifted to consumers.



(a) Tax incidence and elastic demand

(b) Tax incidence and inelastic demand

s os o a (P_e P_1) o o s rs a ar o ly a s all or o (P_1 P_a) s l s. r s ly s las r 1 - ( ) , r rs s r a or or o o a (P_1 P_b) alls o s ll rs, a a r la ly s all a o (P_i P_1) s s o y rs. l r a y also l s l ss a las s ly a o s a las s ly.

Gol s a a l o a ro a las s ly a o r r-o a s a (s as a ra o a) o l a ly all o ro rs. o -rs ly, a s s ly o as alls s r la ly las , ro rs o l ass o o o s rs o a s a o as alls.

Efficiency Loss of a Tax

s o s r a ro rs a o s rs y ally a ar ar o a s a l o ro rs. ’s o loo or los ly a o rall o o o s a . o s r r 1 - , s al o r 1 -2 o a s a o al a l or o r s ss o .

TAX REVENUES

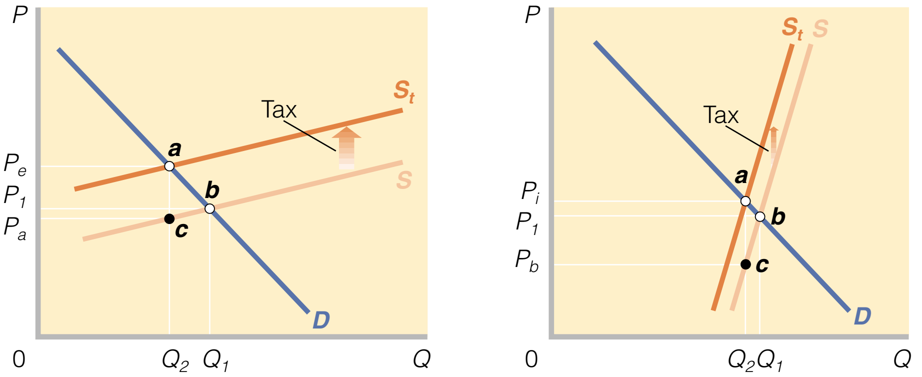
o r a l , a $1 s a o r as s s ar r ro $ o $. 0 r o l a r s l r a y ro 1 ll o o l s o 12. l-l o . Go r a r s $12. ll o ($1 × 12. ll o o l s), a a o s o as r a l *efac* r 1 - . las s o s ly a a s as ar s a o s rs a ro rs a ay al s o al a o , or $ .2 ll o a ($. 0 × 12. ll o o l s). o r s s s $12. ll o o a r o ro l oo s a s r s. o s ra s-r o ollars ro o s rs a ro rs o o r ol s o loss o ll- o so y.

EFFICIENCY LOSS

$1 a o o s or a r r o s rs a ro rs o ay $12. ll o a s also r s l r a o o ro a

FIGURE 19-4

Panel (a): With elastic supply, an excise tax results in a large price increase (P_1 to P_e), and the tax is, therefore, paid mainly by consumers. Panel (b): If supply is inelastic, the price rise is small (P_1 to P_i), and sellers bear most of the tax.

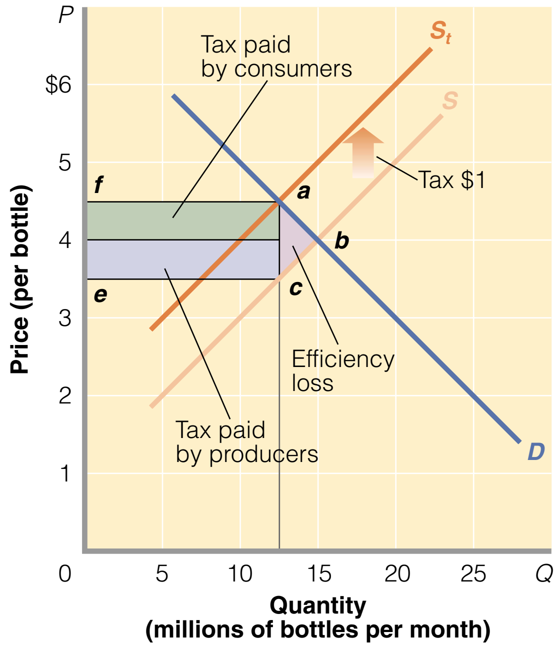


(a) Tax incidence and elastic supply

(b) Tax incidence and inelastic supply

FIGURE 19-5 EFFICIENCY LOSS OF A TAX

The levy of a $1 tax per bottle of wine increases the price per bottle from $4 to $4.50 and reduces the equilibrium quantity from 15 million to 12.5 million. Tax revenue to the government is $12.5 million (area *efac*). The efficiency loss of the tax arises from the 2.5 million decline in output; the amount of that loss is shown as triangle *abc*.



o s y 2. ll o o l s. a a o s rs a ro rs a
a s l 2. ll o or o l s o or a a s a os
2. ll o o l s ro s ss o r ro o os s. s s l ar
ro ollo a alys s.

ab o a r *D* r 1 - a s ll ss o ay
ar al asso a a o 2. ll o o l s o s or
(o a r) a . *cb* o s ly r *S* r s ar al os o a
o l o . or all ry las o o s 2. ll o o l s, ar al
(s o y a o o *ab*) s ar al os (s o y a o o *cb*).
o ro all 2. ll o o l s o r s ll- y a a o r r -
s y r a l *abc*. ar a o s r a l s **efficiency loss of the**
tax (also all *dead eigh lo of he a*). s loss s so y's sa r o -
, a s a r s ro o a o s o o ro lo r
l ls o o o y a ar al a ar al os ar al.

EFFICIENCY LOSS OF A TAX The loss of net benefits to society because a tax reduces the production and consumption of a taxed good below the level of allocative efficiency.

ROLE OF ELASTICITIES

os a s r a so r o y loss, s o s o
s ly a a las s. Gla a a r 1 - , s a -
y loss ar a *abc* s r a r a l (a), r a s r la ly las , a
a l ( ), r a s r la ly las . larly, ar a *abc* s r a r
a l (a) o r 1 - a a l ( ), a a lar r y loss r
s ly s or las . r s al, *he g ea e he ela ici ie of l and*
demand, he g ea e he ef cienc lo of a a ic la a .

o a s y l al r s o o ssar ly os al os s o so -
y. o r s s a s a a sys o

a al l oo s a s r s. ral, o r s o l - y loss o a sys ra s a y s ollar a o o a r .

QUALIFICATIONS

s a o l , o r, a r ay o r a oals as or a , or or or a , a y loss s ro a s. r ar o a l s

1. ***Redistributive goals*** Go r ay a o os ro r ss a s as a ay o r s r o . 10 r s a la o s l l r s o l a a l . a s a or l r s s las , s s a al - y loss s ro s a ar o . o r, o r o l a s ro r s r o s o a o l - y loss s, o l l y l ry a .
2. ***Reducing negative externalities*** o r ay a $1 a o r 1 - o r o s o o y 2. ll o o l s. ay a o l a s o s o o al o ol ra s ro s r- a a r al s. r or , a r os ly l s a o s ar s ly r s a r o r as a a o o r so r s allo a o l , as r 1 - ( ). (*Key Question 9*)

Probable Incidence of Taxes in Canada

’s loo o a ro a l o a o a or so r s o a r a a a.

PERSONAL INCOME TAX

o rso al o a rally s o al a s r s l l a or s . r o s. als a ro s o a o rol r o r la o r s r s ay a l o s a ar o a . s s, la y rs, a o r ro ss o al o l o a r a ly r as r s ay o so a s o a . o s r ar rso al o a s as ar o os o l a , as a r s l , s r r ar a r sol or r a s rso al o a ra s r s . y ar s ss l, y ay s ar o a ro or rs o loy rs, o, y r as r s, s a r as o l . G rally, o r, al o o a s ally l ars r o rso al o a .

CORPORATE INCOME TAX

o or ora o a s l ss r a . ra o al s a a r rr ly ar ro - a r a ro ro - a o ll a o r aso o a r or o a a o or ora o (ro) s os . r a o o a o y l - r a s ro or a ll s ll y l r a s ro a r a r a o r ’s ro s a a ay a a o a . s , o - a y’s s o ol rs (o rs) s ar r o a ro lo r - s or a s all r a o o r a ar s.

o r, o o s s r o a r a s all r o r s o rol a ar , ro rs ay a l o s ar o r or ora o a o o - s rs ro r r s a o r so r s l rs ro lo r r s a a s. a s, so r s ay a l o s r o o oly o r as ro s ll-rs a o o so y o r as r so r y rs o r a al a o o a a y r or ora s o ol rs.

r s o o s s s a o r s o o rall o or ora o a . o ol rs, s o rs, a r so r s l rs ay s ar a r-so o ro or o .

SALES AND EXCISE TAXES

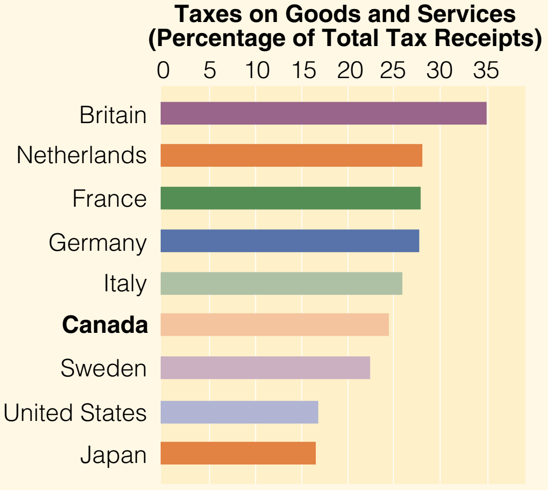
ale a s a ral s a l o a ra o o s r oo s a s r-s, r as a *eci ce ci e a* s o l o ly o a ar lar ro . al s a s ar s ally ra s ar o y r, r as s a s ar o r o ro . a l o a ral sal s a s ral Goo s a r s a (G) s l o os oo s a s r s sol a ross a a a. ll rs o s o so a s ar ly or lar ly o o s rs ro r ro r s. r ay so r o sal s a s a s a s ar s , o r. a s a sal s a o rs a r ra o ro s a a s a o s, o s rs a l l a or s s r oos s a sal s a s al. y a o r allo a r r s o a , lo r- r ro s. r or , sal s a s o s ro ro rs r r y o o s rs. s a s, o r, all o a s l l s o oo s. r or , oss l y o o s rs r o s s oo s a s r s s r a r. s a o - a r s a o s o a ly o o r y so r a l o ass o o o s rs a r r as s. y a s r s ro r 1 - (a), r a s las . r oos o o r s a o a r - s a s o s rs o s s al r a y s o r a . r r o l r sal s so a a s ll r o l ro o ar all, or a lar or o o, s a . (Glo al rs 1 .1 or a o ar so o a s o oo s a s r s ar o s o r s.)

<www.taxpayer.com/opinioneditorials/nationalpost/jan5-1999.htm>
Gasoline and taxes

GLOBAL PERSPECTIVE 19.1

Taxes on goods and services as a percentage of total tax revenues, selected nations

Compared with our major trading partner, the United States, Canada relies more heavily on goods and services taxes—sales taxes, value-added taxes, and specific excise taxes. (A value-added tax applies only to the difference between the value of a firm's sales and the value of its purchases from other firms.)



Source: Organisation for Economic Co-operation and Development data, <www.oecd.org/>.

o r ro s, o s r r as s o o r a s ay a s all r s o sal s. s a s o asol , ar s, a al o ol ra s ro- a l s or s ro s oo s s s s o o s rs a r as r s r s . or s oo s, s ll r s r a l o s arly all s a o o s rs r s o ar s a o arly lo s r , s s a al r as s s a s o ar s.

GOODS AND SERVICES TAX (GST) Federal tax that replaced the federal sales tax in Canada; it is 7 percent on a broad base of goods and services (the only exemptions are agricultural and fish products, prescription drugs, and medical devices); businesses remit the difference between the value of their sales and the value of their purchases from other firms.

PROPERTY TAXES

a y ro r y a s ar or y ro r y o r a s r s o o r ar y o o y a s . s s y ally r or a s o la , rso al ro r y, a o r-o r s s. la s sol , ro r y a s o l ly o s . y r rs a s a r a s ll a o a o , a s a a o ll r r y r s ll- o o r or la .

a s o r a s ss ro r y ar a r s ory. a s o r ro - r y a , a s ally ar , s olly or ar ro o r o a y ro ss o oos r . s ss ro r y a s ar r a as a s ss os a ar a o a o s a l s ro r , s a s ar or ar ly s o r 's s o rs.

a l 1 - s ar s s s ss o o s a o a s.

RECENT CANADIAN TAX REFORM

a a a a sys as r o o a or a s as o a s (1) 1 a or a (2) **Goods and Services Tax (GST).** a r r o ral o r o ly a ro also l s a s, so o o ral o r .

The 1987 Tax Reform

<www.ctf.ca> Canadian Tax Foundation

rr o y a r or a s a s a ly lo r ar- al a ra s, a a a o r s l rso al o a ro 11 a or s o o ly . r s l as a lo r ar al a ra , , o ro all s, a as as r . a r or s also l a

TABLE 19-3 THE PROBABLE INCIDENCE OF TAXES

Type of tax	Probable incidence
Personal income tax	The household or individual on which it is levied.
Corporate income tax	Some economists conclude the firm on which it is levied bears the tax; others conclude the tax is shifted, wholly or in part, to consumers and resource suppliers.
Sales tax	Consumers who buy the taxed products.
Specific excise taxes	Consumers, producers, or both, depending on elasticities of demand and supply.
Property taxes	Owners in the case of land and owner-occupied residences; tenants in the case of rented property; consumers in the case of business property.

a os a o ro a r s. o ral ar al a ra as o o oa o r .
s o s r or s ral s r a as r as a a la - a ro s o as ro a oo a ar o so al s ra -s, r ar ly loy s ra a a ly allo a , a o r o a a a s. o o s ro s o s a o a sys or ro r ss .

The GST

o ro rsy s rro ro o o G as r . o s aros a s o s rs a s a a o r a ly l or y o al o os o arl a , ral ar y, o a l sla o .

VALUE ADDED TAX (VAT) A tax imposed on the difference between the value of the products sold by a firm and the value of the goods purchased from other firms to produce the product.

G s s lar o a **value-added tax (VAT)**. s l a sal s a , a a l s o ly o r al o a r ’s sal s a al o s r as s ro o r r s. r s ar allo a a r al o a s a o r s. os ro a a o s rrr ly s s as a so r o r - (s Glo al rs 1 .1).

G r la ral sal s a , as l r ar ly o a a - r oo s a as as as 1 r o so ro s. G a r s s a s a r a s l o a roa r as a l s o oo s a s r s. o ly o s ar a r l ral a s ro s, r s r o r s, a al s.

or a a r o G s a or s ar s ro rs a la a r al o a s a o s s o ro ro . or o r, or oo s ar s o G , so y o o a a a a a o ar o o s ally ro oo s.

Reforms of 2000

ral o r o r ary 2000, a or a s o a sys- r a o . os or a a r s ar

- ll a o o rso al o a sys o ro a ay rs a a s a o a a r as s a s y a o .
- r o o l o a ra o 2 ro 2 r o r y ars.
- r o o or ora o a ra o 21 r ro 2 r o s all s ss o .
- r o o a al a s a .
- l a o o r r o s r a o l - o a ay rs.

ral o r la s a o r y ars, y ar 2000 a r or s ll sa a a a s so $ ll o a s. s a r or s r a l as ar ly o l a o o 1 a ro o o r as s r- l s rs a o ll . as as o 1 r or s, so o o s s l a lo r a ra s a s also lay a rol . o o a s r a ra ra o o r o r o so s r ar ly o s lo r a ra s. s l o ass ss r ass r o as a y r o a s o l y o r r os a l a so a s o r al a r .

THE ISSUE OF FREEDOM

o r s sso o o r so a y o s r a s o a as a l s a s r a s r la o s al r o a s a o r o o r a o a r o a s r s s o r ly o l o o os s.

The Conservative Position

a y o s r a o o s s l a, a o o o o os s o a a l s or, r s also a os or o s al r o .

rs s o r orr s ar . r o s a rar a l a la s ory o r s a r a r a o r o s o ra o o o r y o ra o r ol al a s, o r s a r a o r o .[2] o , a s l ar sys o r a s or, s o r o o y r s ly a oos a r a o o s. , as o r o sly, l s or ass a l l o ol al o ra y o or y a o r o ar r . a or y s a o r o r a o r al a o s, or y s o or . s o ol al a ls, l a l , s o s ra so al o s o ss al or a s a l so y. a s als ro ar s a r r s o s s l ly, or o or y a o r o s l ss a s ra s r - s o s ar a ar la . s o o o r s o l s r ly l . ally, ral a o o o r a a so o r o r o - r l a s a l as o o o r .

The Liberal Position

FALLACY OF LIMITED DECISIONS The false notion that there are a limited number of economic decisions to be made so that, if government makes more decisions, there will be fewer private decisions to render.

ral o o s s ar s al o o s r a os o . y say o s r- a s as o **fallacy of limited decisions**. a s, o s r a s l ly ass a r a y ar lar r o r s a l , or , - r o s o s o a o ra o o o o y. o r a s or o s s o s r or s o s, r a s or o o - o y ll ssar ly a r s o s l o a r ly. ral o o s s r ar s as alla o s r aso . y s o sor ro o o l oo s, o r s ra o r o y r so y o oy oo s a s r s a o l o a a la l o o r al ro s o . a ar a s lar ly ro o o o s o o r a a r o rs l s so as r ro ora , loy , o r y, s as , r , s r a o , a o r lls. ro os l oo s, o - r o s o y ally r a ro o s l , ra r, r as s os oo s ro r a r r s . ral o r s o l a r ro al ay, r a o r s ar r s o s l y o a a y s s o s a o s o o arry o s s o . l a o o s ass ar l ral s or s

ra l s o r a l y r o . s o a ra a o o roa , as r ally r or r r l s as al -

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[2] Milton Friedman, *Capitalism and Freedom* (Chicago: University of Chicago Press, 1962), p. 2.
[3] Ibid., p. 23.

ra o al o r o , or or r r s a o or s or ro as a
ol , r as or r as y ro o o ll- r s o
l s o l s, yo o , ar also o l s. ro ra
l , a , al o ar al s ay o l or r, y
oo ra o a o r o r a r a r r o .

The LAST word

ALMOST EVERYONE WINS WITH A SINGLE RATE OF TAXATION

In an opinion piece in the* Calgary Herald*, Mark Milke, director of the Canadian Taxpayers Federation, extols the merits of the flat tax.

A single rate of tax on Albertan's personal incomes would be progressive, fair, and a benefit to almost every taxpayer. Last week, the Alberta Income Tax Review Committee recommended precisely such an idea to the provincial government. Unfortunately, some politicians and pundits reacted with outright hostility as if the committee suggested clubbing baby seals instead of lowering taxes.

Here is what they recommended: that Albertans stop calculating provincial income tax as a percentage of federal tax. Right now, Albertans tally up their federal taxes and then take 44 percent of that amount (plus surtaxes) to come up with their provincial taxes. The report recommended Albertans calculate their personal income taxes based on taxable income—all deductions and credits will still be there—and a single tax rate of 11 percent.

Why should this change matter? Because the committee also proposed a provincial basic personal exemption of $11,620 (compared to the federal credit of $6456/$6956—the latter for low-income earners) and—hold your breath—indexing it for inflation. If successfully implemented, 78,000 low-income Albertans will no longer pay provincial income tax. And when indexed for inflation, provincial taxpayers will be protected against "bracket creep" taxation. Hell will first need to freeze before Ottawa indexes federal tax brackets for inflation. And as it will need to snow in Hades before the federal exemption is raised to a decent level, it is worth the change to get the ball rolling on these two concerns.

So what's the problem? Plenty, according to those who argue the tax system should penalize productivity and wealth creation through steeply higher tax rates according to income. They may not object to a generous basic personal exemption, but they claim a single rate of 11 percent amounts to a flat tax where the rich would pay the same rate of tax as the poor. A single rate, some say, is not "progressive."

Nonsense. Because of the $11,620 exemption, higher incomes would still pay a greater percentage of their total income in provincial taxes. Earn $10,000 and you pay zero in provincial income taxes, whereas a $30,000 wage earner would pay 6.7 percent. Earn $60,000 and the province's take would be 8.9 percent of your total income. (Don't panic if that looks like you would pay more. None of those figures include the effect of tax credits.) Tax rates would still be progressive but not as harshly steep as now.

Some claim a single tax rate would hurt middle income earners. Poppycock. A revenue neutral change to the tax system would make some people pay more if others are to pay less. To avoid that, the committee had to propose tax relief for almost everyone. (OK—a single grocery clerk making $30,000 a year will pay an extra 36 bucks if this

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[4] Paul A. Samuelson, "Personal Freedoms and Economic Freedoms in the Mixed Economy," in Earl F. Cheit (ed.), *The Business Establishment* (New York: John Wiley & Sons, 1964), p. 219.

proposal goes through, but he or she will appreciate the sacrifice.)

As an income group, those under $30,000 will see 34 percent of the proposed tax reduction. Those earning over $100,000 will get 29 percent of the cut. The middle-income crowd will garner 37 percent of the proposed tax relief. (Note to critics: that's the largest share.) One can jiggle those figures around to argue that some middle-income group will see less of the cut than some high-income group, but so what? Regardless, the proposals will shrink the individual bill for just about everyone.

This is a problem?

Can Alberta Treasury afford the $500 million tax cut? Yes. And they owe it to us. This year, the province will collect $4.2 billion in personal income tax in 1998–99. That's $1 billion more than three years ago. This year's total personal tax take also includes $350 million from the high-income surtax and flat tax imposed in the 1980s to fight a deficit that disappeared five years ago. Keep in mind that part of the boom in personal income tax revenues results from bracket creep taxation. And need we address the Canada Pension Plan increases, which Alberta agreed to and will take $320 million more out of Albertan's pockets in 1999 than in 1998? On a personal level, the CPP hikes will cost a $35,800 salary an extra $700 a year by 2003 when compared with 1996. Both levels of government should compensate Canadians for that tax hike.

Despite this year's small provincial tax reduction, taxes are still historically high in Alberta. Fifteen years ago, the provincial income tax rate was 38.5 percent with no surtaxes on top. Are critics of tax relief saying Alberta cannot live with tax rates closer to where they were during the Lougheed era?

Of course, the province could cut taxes without changing how we calculate them. But de-linking provincial taxes from Ottawa means provincial taxes would no longer be automatically raised by federal bracket creep. And a single rate would preserve progressivity in the tax system, but without destroying the incentives to work, save and invest, as is currently the case under the steeply progressive and punitive Ottawa-linked rates.

There is nothing radical about a single rate of taxation. Five American states have a single rate. Another nine have no state income tax whatsoever. As for the "flat" tax idea—it does exist in Hong Kong, where the effective tax rate is 15 percent and includes a generous basic personal exemption and charitable deductions, which of course, means it is still progressive. Most important of all, if Alberta implements a single rate and combines it with overall lower taxes, it will pressure the other provinces and Ottawa to get their high tax rates down. That will promote saving, spending and investing, which will in turn have a positive effect upon job creation.

Source: *Calgary Herald* Editorials, November 4, 1998. Reproduced with the permission of Mark Milke, Alberta Director for the Canadian Taxpayers Federation.

CHAPTER SUMMARY

1. Majority voting creates a possibility of (a) an underallocation or an overallocation of resources to a particular public good and (b) inconsistent voting outcomes. The median-voter model predicts that, under majority rule, the person holding the middle position on an issue will determine the outcome of an election involving that issue.
2. Public choice theorists cite reasons why government might be inefficient in providing public goods and services: (a) There are strong reasons for politicians to support special-interest legislation; (b) Politicians may be biased in favour of programs with immediate and clear-cut benefits and difficult-to-identify costs and against programs with

immediate and easily identified costs and vague or deferred benefits; (c) Citizens as voters and governmental representatives face limited and bundled choices as to public goods and services, whereas consumers in the private sector can be highly selective in their choices; (d) Government bureaucracies have less incentive to operate efficiently than do private businesses.

3. The benefits-received principle of taxation states that those who receive the benefits of goods and services provided by government should pay the taxes required to finance them. The ability-to-pay principle states that those who have greater income should be taxed more, absolutely and relatively, than those who have less income.
4. The federal personal income tax is progressive. The flat rate corporate income tax is regressive. General sales, excise, and property taxes are regressive.
5. Excise taxes affect supply and, therefore, equilibrium price and quantity. The more inelastic the demand for a product, the greater is the portion of an excise tax that is shifted to consumers. The greater the inelasticity of supply, the larger the portion of the tax that is borne by the seller.
6. Taxation involves the loss of some output whose marginal benefit exceeds its marginal cost. The more elastic the supply and demand curves, the greater the efficiency loss resulting from a particular tax.
7. Sales taxes normally are shifted to consumers; personal income taxes are not shifted. Specific excise taxes may or may not be shifted to consumers, depending on the elasticities of demand and supply. Disagreement exists as to whether corporate income taxes are shifted. Property taxes on owner-occupied property are borne by the owner; those on rental property are borne by tenants.
8. The 1987 federal tax reform simplified income taxes and lowered the marginal tax rate. The 2000 federal tax reform lowered the personal income tax rate for middle-income Canadians.
9. The GST is similar to a value added tax. It is an improvement over the federal sales tax it replaced because it introduces fewer distortions, exports are exempt, and imports compete on equal footing with domestic goods.
10. Conservatives believe that individual freedom shrinks as government grows in size or power; liberals believe it does not.

TERMS AND CONCEPTS

public choice theory, p. 484
logrolling, p. 486
paradox of voting, p. 486
median-voter model, p. 487
government failure, p. 489
special-interest effect, p. 489
rent-seeking behaviour, p. 490
benefits-received principle, p. 493
ability-to-pay principle, p. 493
progressive tax, p. 494
regressive tax, p. 494
proportional tax, p. 494
tax incidence, p. 496
efficiency loss of a tax, p. 499
Goods and Services Tax (GST), p. 502
value added tax (VAT), p. 503
fallacy of limited decisions, p. 504

STUDY QUESTIONS

1. Explain how affirmative and negative majority votes can sometimes lead to inefficient allocations of resources to public goods. Is this problem likely to be greater under a benefits-received or under an ability-to-pay tax system? Use the information in Figure 19-1(a) and (b) to show how society might be better off if Adams were allowed to buy votes.
2. KEY QUESTION Explain the paradox of voting through reference to the accompanying table, which shows the ranking of three public goods by voters Larry, Curley, and Moe:

	Rankings		
Public good	**Larry**	**Curley**	**Moe**
Courthouse	2nd choice	1st choice	3rd choice
School	3rd choice	2nd choice	1st choice
Park	1st choice	3rd choice	2nd choice

3. **KEY QUESTION** Suppose there are only five people in a society and each favours one of the five highway construction options in Table 18-2 (include no highway construction as one of the options). Explain which of these highway options will be selected using a majority paired-choice vote. Will this option be the optimal size of the project from an economic perspective?

4. **KEY QUESTION** How does the problem of limited and bundled choice in the public sector relate to economic efficiency? Why are public bureaucracies alleged to be less efficient than private enterprises?

5. Explain: "Politicians would make more rational economic decisions if they weren't running for re-election every few years."

6. Distinguish between the benefits-received and the ability-to-pay principles of taxation. Which philosophy is more evident in our present tax structure? Justify your answer. To which principle of taxation do you subscribe? Why?

7. **KEY QUESTION** Suppose a tax is such that an individual with an income of $10,000 pays $2000 of tax, a person with an income of $20,000 pays $3000 of tax, a person with an income of $30,000 pays $4000 of tax, and so forth. What is each person's average tax rate? Is this tax regressive, proportional, or progressive?

8. What is meant by a progressive tax? A regressive tax? A proportional tax? Comment on the progressivity or regressivity of each of the following taxes, indicating your assumption concerning tax incidence: (a) the federal personal income tax, (b) a 7 percent general sales tax, (c) a federal excise tax on automobile tires, (d) a municipal property tax on real estate, (e) the federal corporate income tax.

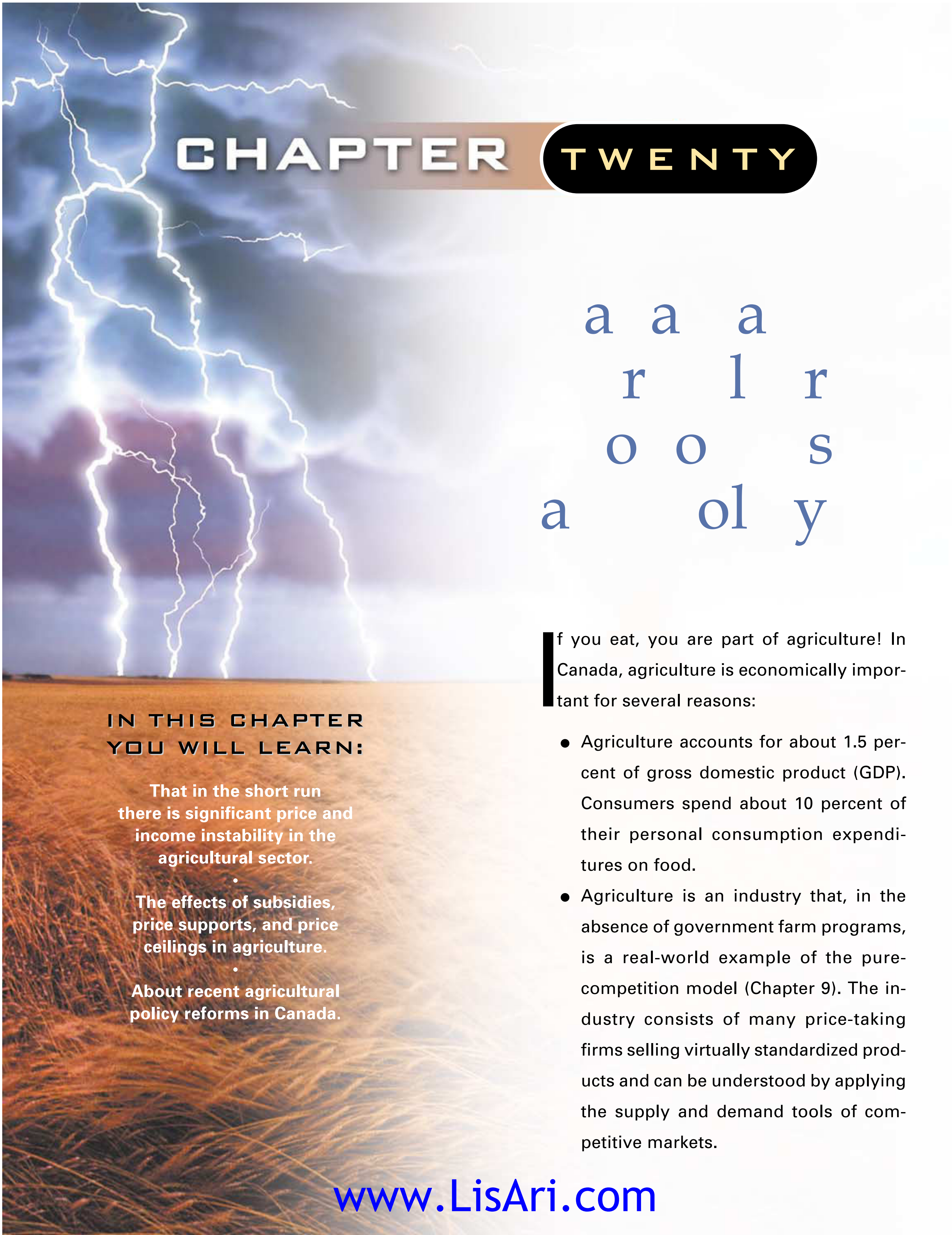
9. **KEY QUESTION** What is the incidence of an excise tax when demand is highly inelastic? elastic? What effect does the elasticity of supply have on the incidence of an excise tax? What is the efficiency loss of a tax, and how does it relate to elasticity of demand and supply?

10. **Advanced analysis** Suppose the equation for the demand curve for some product X is $P = 8 - .6Q$ and the supply curve is $P = 2 + .4Q$. What are the equilibrium price and quantity? Now suppose an excise tax is imposed on X such that the new supply equation is $P = 4 + .4Q$. How much tax revenue will this excise tax yield the government? Graph the curves and label the area of the graph that represents the tax collection "TC" and the area that represents the efficiency loss of the tax "EL." Briefly explain why area EL is the efficiency loss of the tax but TC is not.

11. **(The Last Word)** What are the merits of a single rate of taxation? What is the main drawback of a single rate of taxation?

INTERNET APPLICATION QUESTION

1. Some economists contend that public agencies generally are less efficient than private businesses. Federal Express, <www.fedex.com>, competes directly with Canada Post, <www.Canadapost.ca>, for delivery of express mail and packages. Assume you need to send an express letter and a package from your address to either Halifax or Vancouver. Based on their interactive rate and options calculators, which service is more competitive as to price and delivery? Does a lower rate with greater delivery options mean greater efficiency? Why or why not?



CHAPTER TWENTY

a a a
r l r
o o s
a ol y

IN THIS CHAPTER YOU WILL LEARN:

That in the short run there is significant price and income instability in the agricultural sector.

•

The effects of subsidies, price supports, and price ceilings in agriculture.

•

About recent agricultural policy reforms in Canada.

If you eat, you are part of agriculture! In Canada, agriculture is economically important for several reasons:

- Agriculture accounts for about 1.5 percent of gross domestic product (GDP). Consumers spend about 10 percent of their personal consumption expenditures on food.
- Agriculture is an industry that, in the absence of government farm programs, is a real-world example of the pure-competition model (Chapter 9). The industry consists of many price-taking firms selling virtually standardized products and can be understood by applying the supply and demand tools of competitive markets.

- r l r ro s o a so o- r ol s a r r or so s ly a a .
- ar ol s ar ll ll s ra o so a r 1 's s al- r s a r -s a o r.
- r l r r s r as lo al a o o ar s. r a s o o s a o so a a a a r l r a los ly o a a a a ss o orl ar s. a a a's a r l ral or s o all $21. ll o 1 , a o o . r o o al a a a r a s or s.

s r al s s y a ll a ro a r l r . ally, a o a ro l s a r l r a a r s l o r r o , y s a o o so a r o , a r a or a s ar ol y.

ECONOMICS OF AGRICULTURE

SHORT-RUN FARM PROBLEM The sharp year-to-year changes in the prices of agricultural products and in the incomes of farmers.

LONG-RUN FARM PROBLEM The tendency for agriculture to be a declining industry as technological progress increases supply relative to an inelastic and slowly increasing demand.

r y ars, a a a ar rs a a s r ly a r s a r- o ally lo o s. r l r as al ays a r s y a l s ss. r ar a ally o s ara ro l s **short-run farm problem** o y ar- o- y ar a o s ar r s a o s a **long-run farm problem** o l a r l ral s ry.

Short-Run Problem: Price and Income Instability

s or -r ar ro l s r s l o (1) a las a or a r l ral ro s, o (2) a o s ar o , a ( ) s s o a r or ar ro s.

INELASTIC DEMAND FOR AGRICULTURAL PRODUCTS

s r ally a a o o s, r las y o a or a r l ral ro s s lo . or ar ro s a r a , las y o s .20 a .2 . s r s s s a r s o a r l ral ro s o l a o all y 0 o 0 r or o s rs o r as r r as s y a r 10 r . o s rs a ar ly a lo al o a o al ar o - o ar al y o a o al s o al r a oo s. y s s so all a as r a o las y o a ss - s a l y. r o o ro alls, o s r s o s s a ro or o r ro s os r s a o all . r la ly al y so s s s o or oo s ry o s . l o o l ay a or , y o o s ro r als a ay o, say, or s als a ay r s o s o a l r la r s o ar ro s. al olo al a ors o s ra a al's a a y o s s oo or o r ro s. las a r l ral a s also r la o s ar al l y. a - o o o y, o la o s rally ll a ll lo s r la ly sa ra oo a r o a r l r . o s ly, a - o al ar ro s ar s o ra ly s ar al l y. a s ry lar r s o s all r as s oo a r o s o .

<www.cfa-fca.ca/index_e.htm> Canadian Federation of Agriculture

FLUCTUATIONS IN OUTPUT

ar o s o a ro y ar o y ar, a ly a s ar rs a l - o rol o r r o . loo s, ro s, ros , s a a ,

a s lar sas rs a a oor ro s, l a ll ro s aso a s lar ro y l s. a ral o a ar yo o rol o ar - rs, y os o a r a or a o o .
a o o a ral o a, ly o a r o a r l r a s l or ar rs o o rol ro o . o sa s o ly s a - r a ro rs a o la a s ally lar or a a or ally s all or o o r la o y ar, a ra-lar or a ry s all ar o o l r s l ro s aso r or al.
r *D* r 20-1 s s s las a or a r l ral ro s. o a las a s a l y o ar ro o , a s y ar r s a o s ar s a l . ar a or a r l r ro s r a s a *D*, s r las y ll a y s all a s o - or la ly lar a s ar r s a o . or a l , s os a a or al ro o Q_n r s l s a or al r o P_n a a or al ar o r r s y r r a l . ry lar ro or a oor ro ll a s lar a o s ro s or al r s a o s a s o las a . a oo ro s aso o rs, r s l lar ro o Q_b ll r ar o o a o ar a $0P_bbQ_b$. a s las , a r as a y sol ll a o a y a or - a - ro or o a l r . r s l s a o al r , a s, o al ar o , ll l s ro or o a ly. larly, a oor ro a s y, say, ro ll oos o al ar o o a r r s y ar a $0P$ Q . l o ll a s a or - a - ro or o a r as r a o a s las . ro ally, or ar rs as a ro , a oor ro ay a l ss a a lar ro a ar s . a s a l ar- a or ar ro s, las y o a a ll r r la ly s all a s o o r la ly lar r a s ar r s a o .

FLUCTUATIONS IN DEMAND

r a or s or -r s a l y o ar o r s l s ro s s a r or a r l ral ro s. os a so o a r l ral o

FIGURE 20-1

Because of the inelasticity of demand for farm products, a relatively small change in output (from Q_n to Q_p or Q_b) will cause a relatively large change in farm prices (from P_n to P_b). Farm income will change from the green area to $0P_ppQ_p$ or $0P_bbQ_b$.

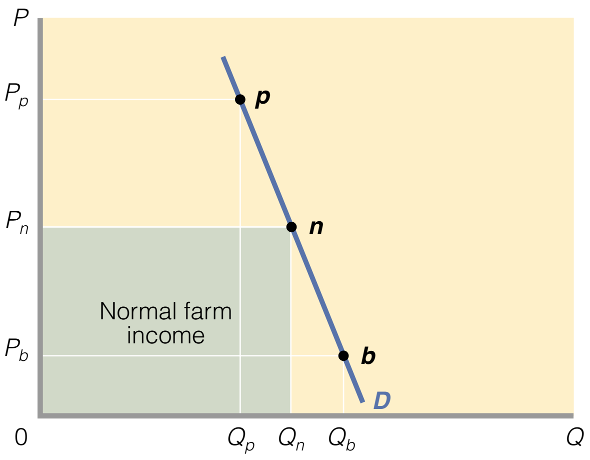
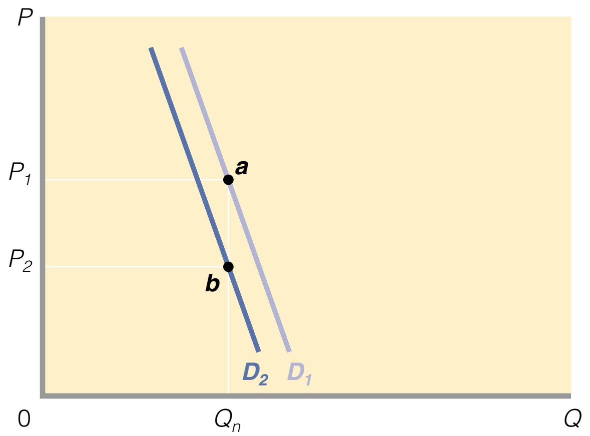


FIGURE 20-2 THE EFFECT OF DEMAND SHIFTS ON FARM PRICES AND INCOME

Because of the highly inelastic demand for agricultural products, a small shift in demand (from D_1 to D_2) will cause drastically different levels of farm prices (P_1 to P_2) and farm income (area $0P_1aQ_n$ to area $0P_2bQ_n$) to be associated with a fixed level of production Q_n.



s s a l a or al l l o Q_n r 20-2. o , a s o las -
y o a or ar ro s, s or -r a s a or os
ro s ll a s ar ly r r s a o s o asso a s
l l o o .
sl ro a ro D_1 o D_2 ll r ar o ro ar a $0P_1aQ_n$.
r la ly s all l a s ar rs s a ly l ss o or
sa a o o ar o . o rs ly, a sl r as a as ro D_2
o D_1 ro s a s a l r as ar o or sa ol o o .
a , lar r a o a s o r a s a s las .
s o ar a s ar l s ar r s a a o a y a
r as a ll a s a y ar rs o los o s or r , r -
o al o a all a r a o l s. ar ro o
s r la ly s s o r a s s or r a s ar rs' os s
ar o ar r ar a l os s.
r s , r , a , a or a ay s o la , l s, a ar
a or os s a y ar r. s ar ar s. la o r s ly o
ar rs a r a l s a also r ar as a os . s lo as y s ay
o r ar s, ar rs a o r r os s y r s l s. r ar a l
os s ar os s o s all a o s o ra l y ay loy, as ll as
r s or s , r l r, a l. s a r s l o r ro or o o
os s, ar rs ar s ally r o or r la y ar los-
o y, s y o l los or y s o r o ra o s or
y ar. ly lo r ll a s s or o s ry.
y s a r l ral a s a l a or so r o a ola l y
a a a a r l r s r s ro s o orl ar s. o s
o a a a ar rs ar s s o a s a r a ro ro o
o r o r s r ro s a roa a l ss or a or a a a ar
ro s. larly, y l al a o s o s a s, ro , or
o as s a, or a l , ay s a or a a a ar ro s.
a s or o o ol s ay also a a . or s a ,
a o s o s r ro o ro r ar rs r a r ro o

ro or o o , a a a ar rs ll a l ss a ss o os ar s a a or a a a ar or s ll all.

r a o al ol s also a o a s a l y. a ol al r la o s a a a a a s a a a a a ss a a oos or s o os o r s so r o s a r o rs. a s r a o al al o a a a ollar ay also r al. r a o o a a a ollar r as s a or a a a ar ro s (o a r or or ar s), r as a r a o o a a a ollar s s or a or a a a ar ro s.

o s ar , r as or a o or s as a l s or -r s a l y o a or a a a ar ro s. ar or s ar a o o ly y a r, o a o s, a o o ol s a roa also y r- a o al ol s a a s r a o al al o ollar. (*Key Question 1*)

Long-Run Problem: A Declining Industry

o o r ara r s s o a r l ral ar s la y a r l r as a l s ry (s a l 20-1)

1. r , *l* o ar ro s as r as ra ly a s o o- lo al ro r ss.
2. *demand* or ar ro s as r as slo ly, a s s las r s o o .

’s a a o s s ly a a or s.

TABLE 20-1 THE DECLINING FARM POPULATION, SELECTED YEARS, 1920–1996

Year	Farm population, millions	Percentage of the total population
1920	3.18	36.6
1929	3.26	32.2
1933	3.24	30.3
1941	3.15	27.4
1951	2.91	20.8
1961	2.13	11.7
1971	1.49	6.9
1981	1.08	4.4
1991	0.88*	3.2
1996	0.89*	3.0

Source: . . r s o , *Canada’ Economic De elo men 1867 1953* (o o o s & o s, 1), . 0, a s s a a a, s so a a a, 1 1 1 1, a a s s a a a, s so a a a 1 . Σ-STAT

* s a as o s o a r l ral la o r or .

TECHNOLOGY AND SUPPLY INCREASES

ra ra o olo al a a as s - a ly r as s ly o a r l ral ro s. s olo al ro r ss as a y roo s a a o o ar s, ro s o la a a , so l o s r a- o , rr a o , lo o y r ro s, a a la l y o ro r l rs a s - s, oly r oa s s, a ro s r a ar o l s o . a o o a al s r ar or r r as 1 s 1 0 a 1 0, r a ol r as a o o la l - a r ar r. s l s as r o s a a s s r as r o o l a s l ar r’s o ll s or . 1 20 a ar or r ro o oo a r o s or o r o l y 1 , a r a r s o a o 1 . y 2000 a ar ro o o s or 120 o l . s o a ly, ys al ol- o ar o r o ar la o r a r l r as r s s a larly. r las 0 y ars, s ys al ro y a r l- r as a a as as as o - ar o o y.

os o olo al a a s a r l r a *no* a y ar - rs, ra r ar r s l o o r -s o sor ro ra s o r s ar a a o a a o ar a ry ro rs. r s a o s, - a o al a l s ss y r l r a r- oo a a a, a r s ar ar s o ar a ry, s , a r l r ro rs a r ary so r s o olo al a a s a a a a r l r .

LAGGING DEMAND

r as s a or a r l ral ro s, o r, a a l o a olo ally r a r as s s ly o ro s. r aso l s o a or r a s o a r l ral a o a o la o .

Income-Inelastic Demand lo o r s, o s rs s o os o r a r o s o a r l ral ro s oo a lo o s s a s l s. as o a s yo s s s a ro l o r s s, o s rs r as r o lays o oo a r- l ra s. o s rs' s o a s ar ll , y r o a s o l a a a r- a s r s, ra r a y a r l r , ro . o o ro a a a as oos a ra r a a o ar yo l l o s s s . s a r s l, r as s o s o a a a o s rs o ro l ss- a - ro or o a r as s s o ar ro s. a or ar ro s a a a s *income-inela ic* s s s o r as s o . s a s a a a 10 r r as r al r a a a r- a o ro s a o a 2 r r as o s o o ar ro - s. a a s a o o o las y o .2 (.02/.10). o, as o s o a a a s r s , a or ar ro s r as s ar l ss ra ly a a or ro s ral.

<www.agr.ca/cb/factsheets/2indus_e.html> Canada's agrifood industry factsheet

Population Growth a r a o l l as r a , a o s r's a o oo a r o s r la ly . s, s s r as s a r ly o ro r o o s rs. os a a a o s, l a a a, a or ar ro s r as s a a ra ro ly al o ra o o la o ro . a s a a a o la o ro as o ra , o r, r as a a a a or ar ro s as o a ra ro o ar o .

GRAPHICAL PORTRAYAL

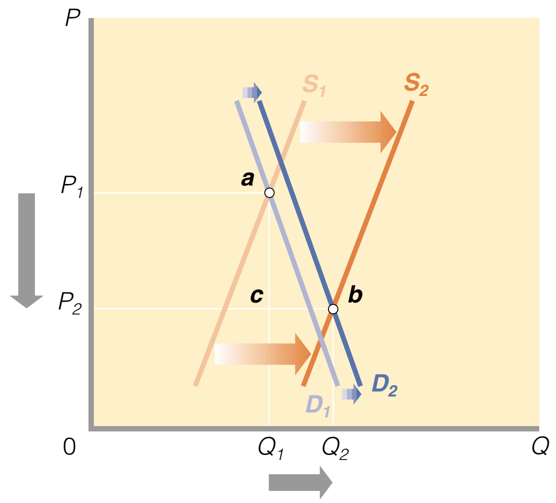
o a o o a las a slo ly r as a or a r l ral ro s a ra ly r as s ly s s ro o ar r ss r o ar r s a o . r 20- s o s a lar r as a r l ral s ly a o - a y a ry o s r as a . a s o las y o a , os o s s s r s l a s ar l ar r s, a o a y a r la- ly s all r as o , so ar o l s. ra , s a ar o or r as s a a s ly (as r y r a l $0P_1aQ_1$) s ar o a r os r as s ($0P_2bQ_2$). a s o a las a or ar ro s, a r as s ly o s ro s r la o a r a s a rs s o ar r ss r o ar o .

CONSEQUENCES

a al o s s o r a os r y r - o - o o l. a s o a a s ly o o s s o l , a y s all, - os ar s a a o ro s al o o s or ro y

FIGURE 20-3 A GRAPHICAL DEPICTION OF THE LONG-RUN CANADIAN FARM PROBLEM

In the long run, increases in the demand for U.S. farm products (from D_1 to D_2) have not kept pace with the increases in supply (from S_1 to S_2) that technological advances have permitted. Because agricultural demand is inelastic, these shifts have tended to depress farm prices (from P_1 to P_2) and reduce farm income (from $0P_1aQ_1$ to $0P_2bQ_2$) while increasing output only modestly (from Q_1 to Q_2).



a s a o o ra ro a ly. lo r , a al loss s a r l r a
r r a ass o or rs o o r s ors o o o y, as y
l ar o la o a l 20-1. y a also a s a a or o sol-
a o o s all r ar s o lar r o s. rso ar , say, 2 0 ar s o or
r a s a o s o ay l ly o ar o or r s a r o
a r s. or ora r s all **agribusiness** a r so ar as o
ar s as o a o s, , a o l ry.

AGRIBUSINESS Large corporate firms in farming.

ra o ally, o o ar o s ol s as ar lo a o o ar
o s ol s, a as a as a . ra o a o sol a-
o a oos ar o *e fa m ho ehold*, as as r as r
o rs o ar o s ol s o ar a o s ar y o s a s. s
a r s l , a ra o o ar o s ol s as r as r la o o
o o ar o s ol s. r s ly, a ra o s o o ro s ar ry
s lar. (***Key Question 3***)

s Glo al rs 20.1 s o s, oor a o s a r r a s o
r la o r or s a r l r a o a a a a o r s r al a o s.

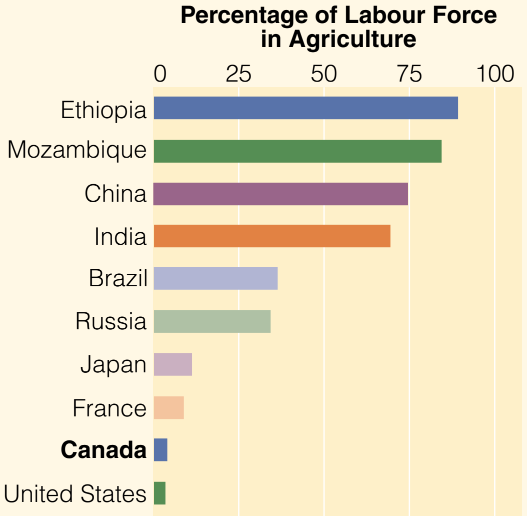
QUICK REVIEW

- Agricultural prices and incomes are volatile in the short run because an inelastic demand converts small changes in farm output and demand into relatively larger changes in prices and income.
- Technological progress has generated large increases in the supply of farm products over time.
- Increases in demand for farm products have been modest in Canada, because demand is inelastic with respect to income and because population growth has been modest.
- The combination of large increases in supply and small increases in demand has made Canadian agriculture a declining industry.

GLOBAL PERSPECTIVE 20.1

Percentage of labour force in agriculture, selected nations

High-income nations devote a much smaller percentage of their labour forces to agriculture than do low-income nations. Because their workforces are so heavily committed to producing the food and fibre needed for their populations, low-income nations have relatively less labour available to produce housing, schools, autos, and the other goods and services that contribute to a high standard of living.



Source: International Labour Office, <www.ilo.org/>.

ECONOMICS OF FARM POLICY

a a a o r as s s a r l r s 1 0s a ar ro ra a l s (1) s or or ar r s, o , a o (2) so l a a r o s r a o ( ) a r l ral r s ar ( ) ar r ( ) ro s ra a ( ) s s sal o ar ro s orl ar s. o r, y al ar r a a ra ol a o a ar ro ra as r ar ly a rora o ro r s a o , a s s r -s or as o ar oly a ll lor . 1 0 a 1 , a a a ar rs r a a ra o o r $1 ll o o s s s a y ar. s a Glo al rs 20.2, ar s s s ar o o a y a o s.

Rationale for Farm Subsidies

ar y o ar s a a o s y ar s s s o r a s

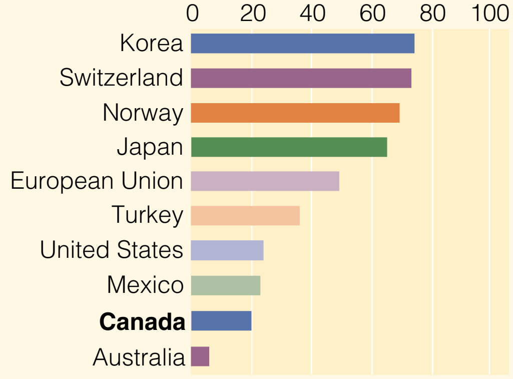
- l o ar ro s ar ss so l , a y ar rs a r la ly lo o s so y s o l r r r s a o s ro l l .
- a ly ar s a a al a a a s o a s o l rr as a ay o l .
- ar rs ar s o raor ary a ar s oo , ro s, a s s a os o r s r s o o a . o o r l , ar rs a o lly s r s l s a a s s sas rs.
- l ar rs a r ly o ar s or r o s, y y s o r l r, ar a ry, a asol ro s r s a a

GLOBAL PERSPECTIVE 20.2

Agricultural subsidies, selected nations

Farmers in various countries receive large percentages of their incomes as government subsidies.

Government Subsidies as a Percentage of Farm Production, 1999



Source: *OECD in Figures*, pp. 26–27, <www.oecd.org/>, 2000.

o s ra l ar o r. r as os s r s ar a l o o rol r r s, ar rs ar a r y o ar s ll r o . s - or rs o s s s ar a a r l r arra s l a o o s s- a a a o s r s o ra a y ar rs.

THE ECONOMICS OF PRICE SUPPORTS

a a a a r l ral ol y as as a a s a l a r l ral r s a l ls a r s l r o s or ar rs. a ools s a r l- ral s a l a o ar ar oar s a **price supports**, o r -s or r s.

SUPPORT PRICES Government-supported minimum prices for agricultural products.

Marketing Boards

o y so a r l ral ar oar s s . a s o r as r s y r - la s ly, o r a s as a ar a y or ro rs.

HISTORICAL BACKGROUND

r Gr a r ss o o 1 0s, a y ar rs l y r o a or o ra a r s ss. ral l as a s all ar r a lo o r- o- y r s ro ro ssors, a ar rs o l o s ss lly ol r ro o or r . ol al r ss r ro ar rs l o ass o a ral ro s ar 1 , s - ral ar oar . s oar o l l a s o r o lo al ro rs' oar s, a s os or a o r as o roll sal s o a r l ral ro s. ral la as s r o y o r s o ro s a r la o o ra *i hin* a a a a r ro al r s o . ral ro s, s ar r s ol a 1 a ar o 1 , ass la s allo alr a y - o ar oar s o o r ro al a or y. y 1 0 all ro s

CANADIAN WHEAT MARKETING BOARD A board that maintains the price of wheat at board-determined levels through the control of product supply and that acts as the marketing agency for wheat producers.

<www.cwb.ca>
Canadian Wheat Board

a ar ar l sla o or or , ass s l slao 1 . a r os o s ar oar s ass ly a a a a o r s a oar - r l ls ro o rol o ro s ly.

1 **Canadian heat Marketing oard** as r a . s o 2001 s ll a o l o rol o r r a ar o s r a . ar rs l r r a o a oar , y r a al ay r s l a s r o a ra s ll r . s s a oor r a s s lo o a a oar s r aso a ly a l o s ll a a l as a a r . ro rs s s ly ll a ra s ll r

a oar s a l o o o s a r a o al ar s, l ss ra s-or a o os s, s ora os s, a a s ra s s. ar rs a ra r a oar s a l or al o r o rs o y ar. ar r s o s o a o orry a r s ay ro s l r o a oar . ar oar s a o s a l a r l ral r s a al l a s r s r o s o ar rs. s a a o l s ro r s or s.

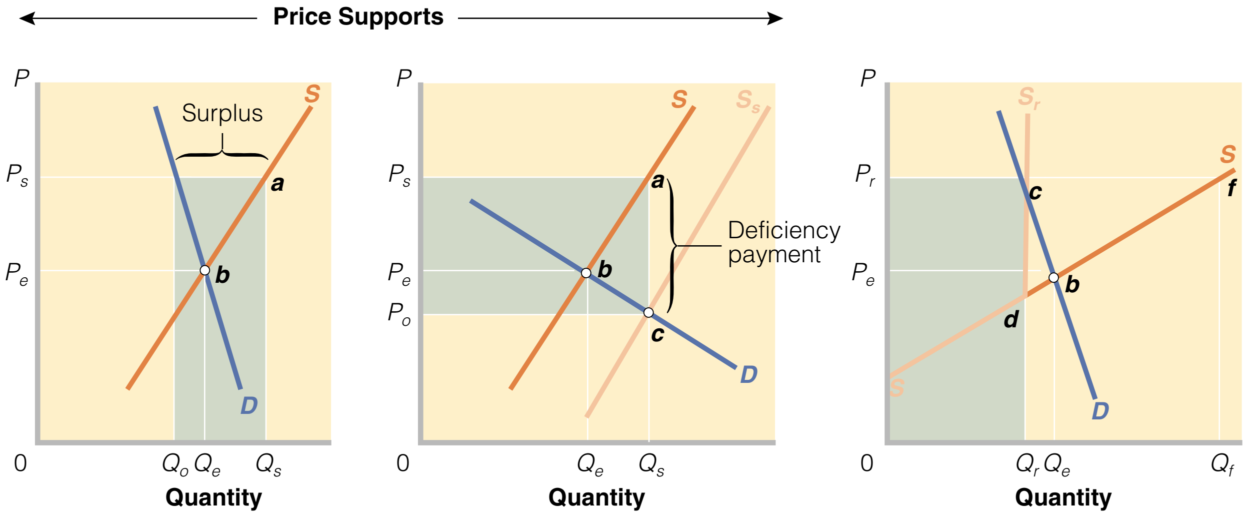
r ar o as o s o s or r s a o r ar l r al s (1) o rs o r as a (2) y ay s.

Offers to Purchase

ar oar a r as ar o y s r a r ar rs or r ro o s o all lo a s . r 20- (a) l 's ass a *oo ice* or, as s o o ly all , s or r s *P* . a or s ar as ollo s

- *Surplus output* os o o s r s l s ro s r l s. o s rs ar ll o r as o ly Q_o s a s or r , l ar rs ll

FIGURE 20-4



(a) Offers to purchase **(b) Deficiency payments** **(c) Crop restriction**

Panel (a): Offers to purchase result in surpluses. Panel (b): Deficiency payments or subsidies do not result in surpluses. Panel (c): Crop restriction results in neither surpluses nor government payments. All costs (the higher price) are borne by consumers.

s ly Q s. o r s y s r l s (Q Q_c) o a a o - l r s or r . s r l s s ar s ra l o o o s. rs , r ry s a s a sallo a o o o o y's r so r s. Go r - l s r l s s a a o o y s o oo a y r so r s o ro o o o o s a , a s- s or r s, ar o a y o s rs. o , s or o s r l s ro s s s , a o os o ar ro ra a , l a ly, o o s r's a ll. or a l , la 1 0s ral o r a la or a ll o lo ra s o r as r o a a a a o - l r r . sol o as o o r r o r o l, o r sol a roa a al r r .

- ***Loss to consumers*** o s rs los a s y ay a r r (P ra r a P_e) a o s l ss (Q_o ra r a Q_e) o ro . y also ay r a s o a o r 's r as o s r l s. r 20- (a), s a a r ll a o o s r l s o Q_o Q l- l y s r , P . ora os s a o s a r . or a ly, r oo r s all s ro or o a ly o oor a s y s a lar r or o o r o s o oo .
- ***Gain to farmers*** ar rs a ro r s or s. r 20- (a), ross r s r s ro r ar l l o $0P_ebQ_e$ o lar r s or l l o ar a $0P aQ$.

Deficiency Payments

DEFICIENCY PAYMENTS Subsidies that make up the difference between market prices and government-supported prices.

Deficiency payments, a o r o o r s or s, ar s s s a a r ar r a o r -s or r . - r 20- ( ) s os a s or r s P . lso, as or , a r P ar rs a ro o ro Q_e o Q . o r, a ass o y D, o s rs ll o ly y Q r s P_o. o r arra s or s o ar r y s ly s s ro o y a o P_o P . o r a s a y ay o a ro r al o P_o P s a y sol . o al o s r r s $0P_ocQ$, o al o r r s $P_oP ac$ y ay s Q . ro rs ar s ll o or al s ly r S. o r, S s s ly r as s y o s r a s r a y y ay . a aly o o o s ay s, o o s ra o s ar s .

ELASTICITY OF SUPPLY AND DEMAND

o s s y, l sal s a , s o las y o s- ly a a r s. r 20- ( ), o s o las a r r ra P_oP a las s ly r r s l s s y o os ly o ro r ro r s P_eS o y ay- , o s r o ly P_eP_o. o las y o o a s s y s r s ly sa as a o a sal s a .

COMPARING OFFERS TO PURCHASE AND DEFICIENCY PAYMENTS

ss , as a o , a P s sa o r s 20- (a) a ( ), ar - rs ll ally ro o ro ra s r o al o ll $0P aQ$ a as . o s rs r r y ay s s y r a lar a o o o (Q) a a lo r (P_o). s o ar s a r (P) a s all a y (Q_o) r a ro ra o o rs o r as . s s s o a - ay rs o ar rs (r ar as) ar a o a o , a o al ay- s y l (o s o r s l s a - a s s s) o ar rs ar al r o ro ra s 0P aQ .

rs o r as a y ay s a o a r . rs o r as r s l o r - l s r l s s a a os ly o s or . l s ra l o a so r s r s o s as a r a a s a y ar or o o ro a l r s, s a o r a r or o r o s r s o l- l o s a y ar s ly o s or lar s r l s s o ar o o s.

RESOURCE OVERALLOCATION

or s l os s s o o rs o r as a y ay s. o - y los s a s r s or s o r o o o y y o ra a o rallo a o o r so r s o a r l r . r oor (P) a ra s or r so r s o a r l ral s or a o l r ar r (P_e). r s o a r 's r o o o l, ar s ly r r 20- r - r s s ar al os s o all ar rs ro s ro a ar o s o s Q_o. allo a o o r so r s o rs a o b, r ar r P_e s al o ar al os s. o Q_e r s a allo a o o r so r s. o ras , o Q asso a r s or P r r s s a o r- allo a o o r so r s ar al os o ra ro o s s ar al o so y. o y rs a *ef cienc lo* ro r -s or sys .

ENVIRONMENTAL COSTS

o ro r 20- a r s or s l a o a o al ro o . l o so o s ra o ay r r a o al la , o a ro o o s ro r a r s o r l r a s s. os s s a r l rs oll ro (or a l , ro a r) a os al r s s o ar or rs a o o s rs as r s s oo . s ar s o s a os r la o s l l o r -s or s s s a s o a r als.

ar ol y ay also a s ro al ro l s l ss o o s ays. rs , ar rs ro r s or s o ly y s r la o s s ly or a s ro s as or or a . s r a s a s o ra s ro ro a o , s a o al or o roll s s. ar ol y s s o ra s s s o o o al or al s o rol.

o , a r as r o a ro ll r as a or r l - a s. ar lar, r s or s or ar ro s r as a or la . la a ar rs r o ar ro o s o ro ally s - s ar al la s as s ly slo , ly ro a l la or la s a ro l l a a . larly, r s or s r s l s o or a r or rr a o , a r s l r o ay o r o so l ros o .

INTERNATIONAL COSTS

os s o ar r s or s a ally o yo os a y r 20- . r s or s ra o o s or o s a ross a o al o ar s. or a l , r s or s a a a a a r l ral ar a ra o or ro rs. o s o or a r l ral ro s o l r as s l s a a a, a ra a ro l o s r l s s. o r s ro a , a a a s l ly o os or arr rs or o ar s or o as. s arr rs o r s r o o or or ro rs, l s l a- o sly o ra or o ro l ss a a a ro rs. r s l s a l ss s o orl a r l ral r so r s.

larly, as a a a a o r s r ally a a o r s s lar a r- l ral ro ra s s r l s ar ro s o orl ar s, r s o s ro s ar r ss . lo o r s a ly o orl o o y ar s or r o s ar r a s r or ar s ar r . s, a a a r s or s or a ro o a os s - a os s o r a, a a or a or r. (*Key Question 7*)

Reduction of Surpluses

r 20- s s s a ro ra s s o r ar s ly (s *S* l - ar) or r as ar a (s *D* r ar) o l l oos ar r o ar s or r *P*. r r, s ro ra s o l r or l - a ar s r l s s. a a a o r as r o s ly a a a roa s o r or l a s r l s s.

RESTRICTING SUPPLY

l r ly, l ol y o s a ly o r s r ar o . ar - lar, **crop restriction** a o a r s or s. r r or ara r s or r ro s, ar rs a o a r ol r o ar s y la a ro . o r rs s r s or a s a a o o ro o s rs o l y a s or r . ra sla a a o o o al r o la ar s ssary o ro . s s ly-r s r ro ra s r o ly ar ally s ss l. y o l a s r l s s, a ly a s r o o la r l a o o r s l a ro or o a l ro o . o ar rs r r r ors la a r s la ro o . y also l a r ll la or s ly. r or s , or a r r l r a s s, a ro ar r s o a o r ar . r l ss, o ro r s r o o ly as o r ar s r l s s a r asso a os s o a ay rs.

CROP RESTRICTION In return for guaranteed prices for their crops, farmers agree to limit the number of hectares they plant in that crop.

BOLSTERING DEMAND

Go r as r s ral ays o r as a or a a a a r l ral ro s.

New Uses o o r a r a s ry a s lar s s o r s ar o r a s s or a r l ral oo s. ro o o aso ol, s a l o asol a al o ol a ro ra , s o s a o r as a or ar o . l ss s a a l s s o soy- a s or la a ro rayo s. os r s o l a s a - o rs a o ly o s ly s ss l ols r a or ar ro s.

Domestic and Foreign Demand o r as also r a a ar y o ro- ra s o s la o s o s o o ar ro s. or a l, - ral o r s s ll o s o ollars a y ar o a r s a ro o lo al sal s o a a a ar ro s. r r or , a a a o a ors a r ss ar r a o al ra o a o s o rs a or a o s o r ra arr rs o or o ar ro s. o r 's s ly- r s r a a - r as or s a l r a o o s r l s ro o , y a o s l a s r l s s.

QUICK REVIEW

- Marketing boards aim to stabilize agricultural prices at levels that ensure higher incomes to farmers.
- Price supports are government-imposed price floors (minimum prices) on selected farm products. Price supports can be achieved through (1) offers to purchase, (2) deficiency payments, or (3) crop restrictions.
- Price supports cause surplus production; raise farm income; increase food prices to consumers; and cause an overallocation of resources to agriculture.
- Domestic price supports encourage nations to erect trade barriers against imported farm products and to dump surplus farm products on world markets.

CRITICISM, POLITICS, AND REFORM

r 0 y ars o r o r r -s or ro ra s, a a ar a os ro ra s r o or ll. r as a ro l a o o o s s a ol al l a rs a oals a s o ar oly o r - a a r s .

<www.agr.ca/index_e.phtml> Agriculture and Agri-Food Canada

Criticisms

’s a so o y r s s o a r l ral s s s.

SYMPTOMS, NOT CAUSES

s s y s ra y a r l r as s o r a sy o s, o a s s, o ar ro l . roo a s o ro l as a sallo a o o r so r s a r l r a r s o o o y. s or ally, ro l as o o oo a y ar rs. o a sallo a o as r lately lo ar o . or os ar , l ol y as or o ar s - or ar r s a o s ra r a o ar r so r allo a o ro l s l .

r r, r a o s or s a s r o o l a r l r o o r s o l a o o o ar o a o s. a s, r a o or a o o ar ro ra as slo r allo a o o r so r s ssary o r sol lo -r ar ro l .

MISGUIDED SUBSIDIES

r s or s a s s y ro ra s a ra o ally os ar rs os o l as . oal o ar ol y s o ra s lo ar o s, ollo s a a y ro ra o ral a s o l a a ar rs lo s o s. oor, lo -o ar r o s o ro a s ll o ar o a ro r s or s. s a , lar or ora ar r a s s y r o ss a l o .

r r or , a o -s or ro ra r ar o o l a o ro s. os o o s s say a , o y ro s, r o s s s o s r l ar rs ar ly r ra l o r r -s or s s s a o r ar ly o lar , ros ro s ar rs. r y , say so o o s s, o l ra s o a r ra s or or ar rs ll o o o o ar o o a o s a s ss s r a r a .

r la o o r s la al s. r a o s a ar ro ra s ro o r as al o ar la . y a ro s or al a l , r s or s a la s l or al a l . o s a - y s l l o ar rs, o s o . ar rs r a o 0 r o r ar la , os ly ro ll- o- o o ar la lor s. s, r s or s o a s s y o o l o ar o a ly a ar .

POLICY CONTRADICTIONS

a s ar ol y as a y o s, o l a s o o ra o s. r as os s s r s ar s a a *inc ea ing* ar ro y a s ly o ar ro s, ro r s r o ro ra s r r a ar rs a la o o ro- o o *ed ce* s ly. r s or s or ro s a r as os s or ra rs a o s r r s or a al ro s. o a o ar rs ar s s- a a s r o s al ro l s ar asso a o a o o - s o . o s r a o ro ra s all or s as la or l l a a , l r s or s ro s o r s la o ro o .

The Politics of Farm Policy

o s r s s a o s s s, as y a a a o - s r -s or ro ra or a or ro s or so a y a s a s ll o - s or so ar ro s s as s ar, a s, a o a o o ay. y a so lo or o r o r s or r ar s or a l as so ar ro s

PUBLIC CHOICE THEORY REVISITED

l o ory (a r 1) l s s a s r s s o s. all a r - s a o r o rs a ro (a la o r o , r s a s s- ry, or ar rs ro a ar lar ro) s s ol al a s o ra s r o or al o s l a s o a o r ro or o so y as a ol . r all a s al- r s ol s a ro ra or ol y ro a s all ro r s lar s a s o a lar r ro os rs ally s r s all loss s. o r -s a o r a s al- r- s l la ol s o ar s s s.

os a r a ro o ar rs, say, ro rs or a ry ar rs, or a - a s a l s a ll- a ol al a o o ( ). 's o s o ro o o r ro ra s a ll ra s r o o ro (s s r - s a o r). o ro sly lo s rs o arl a o a or o o r s or s a or o as or s a l . o s s ar y a ol al o r o s o sy a l sla ors. l o ro o s a ly o ra a ro s, ll also a o r o s o l sla ors ro o r ro s o a s or .

o a a s all r s ro l or l ro rs s ss lly lo y o r as s o o a s o so y as a ol a s , o o al os o ro 's ro ra s o s ra l , os os o a al a ay r s s all (s s s al- r s). a ay rs ar l ly o or a o a r o s ro ra s, s y a l - l a s a . l ss yo ra s yo r o s o ro yo r a ly's s ly, yo ro a ly a o a o s ro ra s os yo as a al a - ay r a o s r a r or o o o yo r r o arl a o s or, say, a r s or ro ra or s. s, r s l l or o lo y o o r ’s or s.

l o ory also lls s a ol a s ar l ly o a o r ro ra s a a os s. s a s , a s o r o ar ro ra s. r s ss o o r 20- a a r s or s ol o s ly a ra s- r o o y ro a ay r o ar r os s a ar as r oo r s, s ora os s or s r l s o , os s o a s r ar ro ra s, a os s asso a o o s a r a o al sallo a o s o r so r s. a s os os s ar lar ly r a , ar ro ra s ar or a a l o ol a s a l a y o l all os s r l .

CHANGING POLITICS

s o r s , s al r s s, a lo roll , a o a o o a ors as l o a a ol s o ar s s s.

Declining Political Support s ar o la o as l , a r l r ’s ol al o r as a . ar o la o as a o 0 r o ral o la o 1 0s, a y a a a ar ro ra s r s a - l s o s l ss a r . r a rs o arl a o o s a a or y o r r r ral oll a s. r as r o ar r ally a ar ro ra s or r o o s rs’ ro ry lls as ll as o ar o s. lso, or ar rs s l s ar o o r s r s o o ral o r o r ar s o s.

World Trade Considerations a a a s o o o r s a as a l a o r arr rs o orl ra a r l ral ro s. a as also o r o or r al a o ar ar s s s a ar larly r s or s. a o s o ro a o ( ) a a y o r a o s ro s or or a r l ral r s. , o a a r o s r s, y r s r or s o or ar ro s y os ar s (s a s) a o as (a a l s o or s o or oo s). y ry o r s l s o r o s s r l s s y s s or s o orl ar s.

s o a a a ar a (1) ra arr rs r a a a ar rs ro s ll o a o s, a (2) s s or s ro os a o s r ss orl r s or a r l ral ro s, a orl ar s l ss a ra o a a a ar rs.

r a s os or a , ar ro ra s s as os a a y a a a a s or o orl a r l ral ra a r a o al allo a o o a r l ral r so r s. o ra y ar ally r s, ar rs s r ally a a a o s ro or oo a r a y o l o r s . r s l s r l s s o o orl ar s, r y r ss r s. s a s a ar rs o r s o ar ro ra s a y o lo o - r s a ar ally lo r s or r or s, a a s als o ro l ss. rall, r s l s a s ro o a ay ro a o l o r as o o ara a a a .

o s s or o s, 1 orl ’s ra a o s a r o r ar r -s or ro ra s y 20 r y y ar 2000 a o r ar s a o as o or ar ro s y 1 r . a a a a s a s ro as a a s r s or s s s ss o s a s s a o ly l al r o s a o r s or s s o l o s o ry.

QUICK REVIEW

- Farm policy in Canada has been heavily criticized for delaying the shift of resources away from farming, directing most subsidies to wealthier farmers, and being fraught with policy contradictions.
- The persistence of price supports can largely be explained in terms of rent-seeking behaviour, the special-interest effect, political logrolling, and other aspects of public choice theory.
- Recently, the politics of farm subsidies has changed as a result of the declining political power of farmers and world trade considerations.

The LAST word

ALL ABOUT CANADA'S EGG INDUSTRY

The egg industry in Canada has evolved during the past 100 years from backyard flocks and erratic marketing to a highly specialized, automated, and highly regulated industry.

The Canadian egg industry was valued at $995 million in 1999, almost $30 million of which were exports; this figure includes hatching eggs, eggs for consumption, and processed eggs. About 22 million Canadian laying hens produce close to six billion eggs, with the average laying hen producing about 272 eggs per year.

Canada ranks as the 24th egg-producing country in the world, responsible for 0.7 percent of world egg production in 1998. The largest producer is China, followed by the United States, Japan, the Russian Federation, India, Mexico, and Brazil.

Eight-two percent of Canadian eggs are sold in their shells, and the remaining 18 percent of all grades and sizes are processed into liquid, frozen, or dried form. Quebec and Ontario produce more than half the eggs in Canada. Ontario alone contributes 39.8 percent of the total, Quebec produces 16.6 percent, the Western provinces have a combined egg production of 35.6 percent, and the Eastern provinces have a combined production of 8.0 percent.

Research at universities and colleges, by provincial and federal governments, and in private industry is under way in Canada to investigate ways to improve the egg and poultry industries, including disease control and eradication, feed management, genetics, automation, and new product development. Poultry production and processing are among the most highly mechanized sectors in Canadian agriculture.

Getting the egg from the producer to the grocery store requires coordination and cooperation among producers, egg graders, processors, provincial and federal governments, inspectors, distributors, and retailers. The Canadian Egg Marketing Agency (CEMA) is the producer organization responsible for supply management in Canada. They ensure that producers receive their cost of production plus a reasonable rate of return on their investment while consumers have a constant supply at stable prices.

Because of changing dietary habits, annual total egg consumption in Canada dropped from 23 dozen per person in 1960 to 14.3 dozen in 1995. However, in the past few years, consumption has increased again, and in 1998, egg consumption was 15.2 dozen per person. Processed egg consumption has increased dramatically since 1986.

Source: Agriculture and Agri-Food Canada, Factsheet, <www.agr.ca/cb/factsheets/2egg_e.html>, 2001; and Snapshot of the Canadian Egg Industry, <www.agr.ca/misb/aisd/poultry/eggsnap.pdf>, 1999.

CHAPTER SUMMARY

1. In the short run, the highly inelastic nature of agricultural demand translates small changes in output and small shifts in domestic or foreign demand into large changes in prices and income.
2. Over the long run, rapid technological advance, together with a highly inelastic and relatively slow-growing demand for agricultural output, has caused agriculture to be a declining industry.
3. The use of price floors or price supports has many economic effects: (a) surplus production occurs, (b) the incomes of farmers are increased, (c) consumers pay higher prices for farm products, (d) an overallocation of resources to agriculture occurs, (e) society pays higher taxes to finance the purchase and storage of surplus output, (f) pollution increases because of the greater use of agrichemicals and vulnerable land, and (g) other nations bear the costs associated with import barriers and depressed world agricultural prices.
4. Government has pursued with limited success programs to limit agricultural supply and increase agricultural demand to reduce the surpluses associated with price supports.
5. Economists have criticized farm policy for (a) confusing symptoms (low farm incomes) with causes (excess capacity), (b) providing the largest subsidies to high-income farmers, and (c) creating contradictions among specific farm programs.
6. The persistence of agricultural subsidies can be explained in terms of public choice theory and, in particular, in terms of rent-seeking behaviour and the special-interest effect.
7. Political backing for price supports and crop restriction programs has eroded for several reasons: (a) The number of farmers, and thus their political clout, has declined dramatically relative to the number of urban consumers of farm products, (b) farm subsidies have received close scrutiny due to efforts to eliminate the federal budget deficit, (c) successful efforts by Canada to get other nations to reduce their farm subsidies have altered the domestic debate on the desirability of Canadian farm subsidies.

TERMS AND CONCEPTS

short-run farm problem, p. 510
long-run farm problem, p. 510
agribusiness, p. 515
support prices, p. 517
Canadian Wheat Marketing Board, p. 518
deficiency payments, p. 519
crop restriction, p. 521

STUDY QUESTIONS

1. **KEY QUESTION** Carefully evaluate: “The supply and demand for agricultural products are such that small changes in agricultural supply result in drastic changes in prices. However, large changes in farm prices have modest effects on agricultural output.” (Hint: A brief review of the distinction between supply and quantity supplied may be helpful.) Do exports increase or reduce the instability of demand for farm products? Explain.
2. What relationship, if any, can you detect between the fact that the farmer’s fixed costs of production are large and the fact that the supply of most agricultural products is generally inelastic? Be specific in your answer.
3. **KEY QUESTION** Explain how each of the following contributes to the farm problem:
   - **a.** the inelastic demand for farm products
   - **b.** the rapid technological progress in farming
   - **c.** the modest long-run growth in demand for farm commodities
   - **d.** the volatility of export demand
4. The key to efficient resource allocation is shifting resources from low-productivity to high-productivity uses. In view of the high and expanding physical productivity of agricultural resources, explain why many economists want to divert additional resources from farming to achieve allocative efficiency.

5. Explain and evaluate: "Industry complains of the higher taxes it must pay to finance subsidies to agriculture. Yet the trend of agricultural prices has been downward while industrial prices have been moving upward, suggesting that on balance agriculture is actually subsidizing industry."

6. "Because consumers as a whole must ultimately pay the total incomes received by farmers, it makes no real difference whether the income is paid through free farm markets or through price supports supplemented by subsidies financed out of tax revenue." Do you agree?

7. **KEY QUESTION** Explain the economic effects of price supports. Explicitly include environmental and global impacts in your answer. On what grounds do economists contend that price supports cause a misallocation of resources?

8. Use supply and demand curves to depict equilibrium price and output in a competitive market for some farm product. Then show how an above-equilibrium price floor (price support) would cause a surplus in this market. Demonstrate in your graph how government could reduce the surplus through a policy that (a) changes supply or (b) changes demand. Identify each of the following actual government policies as primarily affecting the supply of or the demand for a particular farm product: crop restriction, government buyout of dairy herds, export promotion.

9. Do you agree with each of the following statements? Explain why or why not.

  a. "The problem with Canadian agriculture is that there are too many farmers. This is not the fault of farmers but the fault of government programs."

  b. "The federal government ought to buy Canadian farm surpluses and give them away to developing nations."

  c. "All industries would like government price supports if they could get them; agriculture received price supports only because of its strong political clout."

10. What are the effects of farm subsidies such as those of Canada and the European Union on (a) domestic agricultural prices, (b) world agricultural prices, and (c) the international allocation of agricultural resources?

11. Use public choice theory to explain the persistence of farm subsidies in the face of major criticisms of these subsidies.

12. **(The Last Word)** How many eggs does the average Canadian laying hen produce? Which country is the largest producer of eggs?

INTERNET APPLICATION QUESTION

1. Agriculture and Agri-Food Canada at <www.agr.ca/cb/factsheets/2indus_e.html> provides an overview of Canadian agriculture and the agrifood business. What are Canada's top five agricultural exports? Which country imports the largest share of Canada's agricultural exports?

Glossary

A

ABILITY-TO-PAY PRINCIPLE The idea that those who have greater income (or wealth) should pay a greater proportion of it as taxes than those who have less income (or wealth).

ABSOLUTE ADVANTAGE When a given amount of resources can produce more of a commodity in one country than in another.

ABSOLUTE POVERTY A situation in which the basic material needs of an individual or a family (food, clothing, shelter) are not met.

ADVERSE SELECTION PROBLEM A problem arising when information known to one party to a contract is not known to the other party, causing the latter to incur major costs.

AGGREGATE A collection of specific economic units treated as if they were one unit.

AGRIBUSINESS Large corporate firms in farming.

ALLOCATIVE EFFICIENCY The apportionment of resources among firms and industries to obtain the production of the products most wanted by society (consumers); the output of each product at which its marginal cost and price or marginal benefit are equal.

ANTI-COMBINES (ANTIMONOPOLY) LEGISLATION Laws designed to prevent the growth of monopoly.

ANTI-COMBINES POLICY The laws and government actions designed to prevent monopoly and promote competition.

APPRECIATION (OF THE DOLLAR) An increase in the value of the dollar relative to the currency of another nation so that a dollar buys a larger amount of the foreign currency and thus of foreign goods.

ASYMMETRIC INFORMATION A situation in which one party to a market transaction has much more information about a product or service than the other does; the result may be an underallocation or overallocation of resources.

AVERAGE FIXED COST (AFC) A firm's total fixed cost divided by output (the quantity of product produced).

AVERAGE PRODUCT (AP) The total output produced per unit of a resource employed (total product divided by the quantity of that employed resource).

AVERAGE REVENUE Total revenue from the sale of a product divided by the quantity of the product sold.

AVERAGE TOTAL COST (ATC) A firm's total cost divided by output (the quantity of product produced); equal to average fixed cost plus average variable cost.

AVERAGE VARIABLE COST (AVC) A firm's total variable cost divided by output (the quantity of product produced).

B

BARRIERS TO ENTRY Anything that artificially prevents the entry of firms into an industry.

BARTER The exchange of one good or service for another good or service.

BENEFITS-RECEIVED PRINCIPLE The idea that those who receive the benefits of goods and services provided by government should pay the taxes required to finance them.

BILATERAL MONOPOLY A market in which there is a single seller (monopoly) and a single buyer (monopsony).

BLACK MARKETS Markets in which products are illegally bought and sold at prices above the legal limits.

BONDS Financial devices through which a borrower (a firm or government) is obligated to pay the principle and interest on a loan at a specific date in the future.

BREAK-EVEN POINT An output at which a firm makes a normal profit but not an economic profit.

BUDGET CONSTRAINT The limit that the size of a consumer's income (and the prices that must be paid for goods and services) imposes on the ability of that consumer to obtain goods and services.

BUDGET LINE A line that shows the different combinations of two products a consumer can purchase with a specific money income, given the products' prices.

C

CANADA PENSION PLAN (CPP) A national retirement plan funded by obligatory employer and employee contributions.

CANADIAN WHEAT MARKETING BOARD A board that maintains the price of wheat at board-determined levels through the control of product supply and that acts as the marketing agency for wheat producers.

CAPITAL Human-made resources (buildings, machinery, and equipment) used to produce goods and services; goods that do not directly satisfy human wants; also called capital goods.

CARTEL A formal agreement among firms in an industry to set the price of a product and establish the outputs of the individual firms or to divide the market among them.

CHANGE IN DEMAND A change in the quantity demanded of a good or service at every price; a shift of the demand curve to the left or right.

CHANGE IN QUANTITY DEMANDED A movement from one point to another on a fixed demand curve caused by a change in price of the product under consideration.

CHANGE IN QUANTITY SUPPLIED A movement from one point to another on a fixed supply curve caused by a change in the price of a product under consideration.

CHANGE IN SUPPLY A change in the quantity supplied of a good or service at every price; a shift of the supply curve to the left or right.

CIRCULAR FLOW MODEL The flow of resources from households to firms and of products from firms to households. These flows are accompanied by reverse flows of money from firms to households and from households to firms.

COASE THEOREM The idea first stated by economist Ronald Coase that spillover problems may be resolved through private negotiations of the affected parties.

COLLUSION A situation in which firms act together and in agreement to fix prices, divide a market, or otherwise restrict competition.

COMBINES INVESTIGATION ACT The Act, in 1910, that authorized a judge, on receiving an application by six people, to order an investigation into an alleged combine; became the Competition Act in 1986.

COMMAND SYSTEM An economic system in which property resources are owned by the government and the economic decisions are made by a central government body.

COMPARATIVE ADVANTAGE A lower relative or comparative cost than another producer.

COMPENSATING DIFFERENCES Differences in the wages received by workers in different jobs to compensate for nonmonetary differences in the jobs.

COMPETITION ACT The Act that replaced the Combines Investigation Act in 1986.

COMPETITION TRIBUNAL A government body that adjudicates under a civil law framework that will permit the issuing of remedial orders to restore and maintain competition in the market.

COMPETITION The presence in a market of a large number of independent buyers and sellers competing with one another and the freedom of buyers and sellers to enter and leave the market.

COMPLEMENTARY GOODS Products and services that are used together; when the price of one falls the demand for the other increases (and conversely).

CONCENTRATION RATIO The percentage of the total sales of an industry produced and sold by an industry's largest firms.

CONGLOMERATE MERGER The merger of a firm in one industry with a firm in another industry or region.

CONSTANT RETURNS TO SCALE The range of output between the output at which economies of scale end and diseconomies of scale begin.

CONSTANT-COST INDUSTRY An industry in which the entry of new firms has no effect on resource prices and thus no effect on production costs.

CONSUMER GOODS Products and services that satisfy human wants directly.

CONSUMER SOVEREIGNTY Determination by consumers of the types and quantities of goods and services that will be produced with the scarce resources of the economy; consumer direction of production through their dollar votes.

CONSUMER SURPLUS The difference between what a consumer is willing to pay for an additional unit of a product or service and its market price.

CORPORATION A legal entity chartered by the federal government that operates as a distinct and separate body from the individuals who own it.

COST–BENEFIT ANALYSIS Comparing the marginal costs of a government project or program with the marginal benefits to decide whether to employ resources in that project or program and to what extent.

CREATIVE DESTRUCTION The hypothesis that the creation of new products and production methods simultaneously destroys the market power of existing monopolies.

CROP RESTRICTION In return for guaranteed prices for their crops, farmers agree to limit the number of hectares they plant in that crop.

CROSS ELASTICITY OF DEMAND The ratio of the percentage change in quantity demanded of one good to the percentage change in the price of some other good; a positive coefficient indicates the two products are substitute goods; a negative coefficient indicates they are complementary goods.

D

DEADWEIGHT LOSS The loss of consumer surplus and producer surplus when output is either below or above its efficient level.

DECREASING-COST INDUSTRY An industry in which the entry of firms lowers the prices of resources and thus decreases production costs.

DEFICIENCY PAYMENTS Subsidies that make up the difference between market prices and government-supported prices; a method of price support.

DEMAND CURVE A curve that illustrates demand.

DEMAND SCHEDULE A schedule showing the amounts of a good or service buyers (or a buyer) wish to purchase at various prices during some period.

DEPENDENT VARIABLE A variable that changes as a consequence of a change in some other (independent) variable; the "effect" or outcome.

DEPRECIATION (OF THE DOLLAR) A decrease in the value of the dollar relative to another currency so that a dollar buys a smaller amount of the foreign currency and therefore of foreign goods.

DERIVED DEMAND The demand for a resource that depends on the products it can be used to produce.

DETERMINANTS OF DEMAND Factors other than its price that determine the quantities demanded of a good or service.

DETERMINANTS OF SUPPLY Factors other than its price that determine the quantities supplied of a good or service.

DIFFERENTIATED OLIGOPOLY An oligopoly in which the firms produce a differentiated product.

DIFFUSION The widespread imitation of an innovation.

DIRECT RELATIONSHIP The relationship between two variables that change in the same direction, for example, product price and quantity supplied.

DISCRIMINATION COEFFICIENT A measure of the cost or disutility of prejudice; the monetary amount an employer is willing to pay to hire a preferred worker rather than a nonpreferred worker.

DISECONOMIES OF SCALE Increase in the average total cost of producing a product as the firm expands the size of its plant (its output) in the long run.

DIVISION OF LABOUR Dividing the work required to produce a product into a number of different tasks that are performed by different workers; specialization of workers.

DOLLAR VOTES The "votes" that consumers and entrepreneurs cast for the production of consumer and capital goods, respectively, when they purchase them in product and resource markets.

DOUBLE TAXATION The taxation of both corporate net income (profits) and the dividends paid from this net income when they become the personal income of households.

E

ECONOMIC (OPPORTUNITY) COST A payment that must be made to obtain and retain the services of a resource; the income a firm must provide to a resource supplier to attract the resource away from an alternative use; equal to the quantity of other products that cannot be produced when resources are instead used to make a particular product.

ECONOMIC (PURE) PROFIT The total revenue of a firm less its economic costs (which includes both explicit costs and implicit costs); also called above normal profit.

ECONOMIC GROWTH (1) An outward shift in the production possibilities curve that results from an increase in resource supplies or quality or an improvement in technology; (2) an increase either in real output (gross domestic product) or in real output per capita.

ECONOMIC PERSPECTIVE A viewpoint that envisions individuals and institutions making rational decisions by comparing the marginal benefits and marginal costs associated with their actions.

ECONOMIC PROBLEMS Choices are necessary because society's material wants for goods and services are unlimited but the resources available to satisfy these wants are limited (scarce).

ECONOMIC PROFIT The total revenue of a firm less its economic costs (which includes both explicit costs and implicit costs); also called "pure profit" and "above normal profit."

ECONOMIC RENT The price paid for the use of land and other natural resources, the supply of which is fixed (perfectly inelastic).

ECONOMIC RESOURCES The land, labour, capital, and entrepreneurial ability that are used in the production of goods and services; productive agents; factors of production.

ECONOMIC SYSTEM A particular set of institutional arrangements and a coordinating mechanism for solving the economizing problem; a method of organizing an economy; of which the market economy, command economy, and traditional economy are three general types.

ECONOMICS The social science dealing with the use of scarce resources to obtain the maximum satisfaction of society's virtually unlimited economic wants.

ECONOMIES OF SCALE Reductions in the average total cost of producing a product as the firm expands the size of plant (its output) in the long run; the economies of mass production.

EFFICIENCY LOSS OF A TAX The loss of net benefits to society because a tax reduces the production and consumption of a taxed good below the level of allocative efficiency.

ELASTIC DEMAND Product or resource demand whose price elasticity is greater than one; means the resulting change in quantity demanded is greater than the percentage change in price.

ELASTICITY OF RESOURCE DEMAND The percentage change in resource quantity divided by the percentage change in resource price; if the result is greater than one, resource demand is elastic; if the result is less than one, resource demand is inelastic; and when the result equals one, resource demand is unit-elastic.

EMPLOYMENT DISCRIMINATION Inferior treatment in hiring, promotion, and work assignment for a particular group of employees.

EMPLOYMENT EQUITY Policies and programs that establish targets of increased employment and promotion for women and minorities.

EMPLOYMENT INSURANCE (EI) A program that insures workers against the hazards of losing their jobs.

ENTREPRENEURIAL ABILITY The human resources that combine the other resources to produce a product, make non-routine decisions, innovate, and bear risks.

EQUILIBRIUM POSITION The combination of products that yields the greatest satisfaction or utility; the combination will lie on the highest attainable indifference curve.

EQUILIBRIUM PRICE The price in a competitive market at which the quantity demanded and the quantity supplied are equal, where there is neither a shortage nor a surplus, and where there is no tendency for price to rise or fall.

EQUILIBRIUM QUANTITY The quantity demanded and supplied at the equilibrium price in a competitive market.

EURO The common currency unit used by 12 European nations in the Euro zone, which includes all nations of the European Union except Great Britain, Denmark, and Sweden.

EUROPEAN UNION (EU) An association of 15 European nations that has eliminated tariffs and import quotas among them, established common tariffs for goods imported from outside the member nations, allowed the free movement of labour and capital among them, and created other common economic policies; includes Austria, Belgium, Denmark, Finland, France, Germany, Great Britain, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, and Sweden.

EXCESS CAPACITY Plant or equipment that is underused because the firm is producing less than the minimum-ATC output.

EXCHANGE RATE The rate of exchange of one nation's currency for another nation's currency.

EXCLUSION PRINCIPLE The ability to exclude those who do not pay for a product from receiving its benefits.

EXCLUSIVE UNIONISM The practice of a labour union of restricting the supply of skilled union labour to increase the wages received by union members; the policies typically employed by a craft union.

EXPECTED-RATE-OF-RETURN CURVE The increase in profit a firm anticipates it will obtain by investing in R&D.

EXPLICIT COSTS The monetary payments a firm must make to an outsider to obtain a resource.

EXPORT SUBSIDIES Government payments to domestic producers to enable them to reduce the price of a good or service to foreign buyers.

EXTERNALITIES A benefit or cost from production or consumption accruing without compensation to nonbuyers and nonsellers of the product.

F

FACTORS OF PRODUCTION Economic resources: land, capital, labour, and entrepreneurial ability.

FAIR-RETURN PRICE The price of a product that enables its producer to obtain a normal profit and that is equal to the average cost of producing it.

FALLACY OF COMPOSITION Incorrectly reasoning that what is true for the individual (or part) is necessarily true for the group (or whole).

FALLACY OF LIMITED DECISIONS The false notion that there are a limited number of economic decisions to be made so that, if government makes more decisions, there will be fewer private decisions to render.

FAST-SECOND STRATEGY The strategy of becoming the second firm to embrace an innovation, allowing the originator to incur the initial high costs of innovation.

FIRM An organization that employs resources to produce a good or service for profit and that owns and operates one or more plants.

FIXED COSTS Any cost that in total does not change when the firm changes its output; the cost of fixed resources.

FOREIGN EXCHANGE MARKET A market in which the money (currency) of one nation can be used to purchase (can be exchanged for) the money of another nation.

FREEDOM OF CHOICE The freedom of owners of property resources to employ or dispose of them as they see fit, of workers to enter any line of work for which they are qualified, and of consumers to spend their incomes in a manner that they think is appropriate.

FREEDOM OF ENTERPRISE The freedom of firms to obtain economic resources, to use these resources to produce products of the firm's own choosing, and to sell their products in markets of their choice.

FREE-RIDER PROBLEM The inability of potential providers of an economically desirable but indivisible good or service to obtain payment from those who benefit, because the exclusion principle is not applicable.

FULL EMPLOYMENT (1) Use of all available resources to produce want-satisfying goods and services. (2) The situation when the unemployment rate is equal to the full-employment unemployment rate and there is frictional and structural but no cyclical unemployment (and the real output of the economy equals its potential real output).

FULL PRODUCTION Employment of available resources so that the maximum amount of (or total value of) goods and services is produced; occurs when both productive efficiency and allocative efficiency are realized.

G

GAME THEORY MODEL A means of analyzing the pricing behaviour of oligopolists using the theory of strategy associated with games such as chess and bridge.

GENERAL AGREEMENT ON TARIFFS AND TRADE (GATT) The international agreement reached in 1947 in which 23 nations agreed to give equal and nondiscriminatory treatment to the other nations, to reduce tariff rates by multinational negotiations, and to eliminate import quotas. Now includes most nations and has become the World Trade Organization.

GENERALIZATIONS Statements of the nature of the relation between two or more sets of facts.

GOODS AND SERVICES TAX (GST) Federal tax that replaced the federal sales tax in Canada; it is 7 percent on a broad base of goods and services (the only exemptions are agricultural and fish products, prescription drugs, and medical devices); businesses remit the difference between the value of their sales and the value of its purchases from other firms.

GOVERNMENT FAILURE Inefficiencies in resource allocation caused by problems in the operation of the public sector (government); occurs because of rent-seeking pressure by special-interest groups, short-sighted political behaviour, limited and bundled choices, and bureaucratic inefficiencies.

GUARANTEED INCOME SUPPLEMENT (GIS) Money paid on application, subject to a means test, to those receiving an OAS pension who have an income below a certain level.

GUIDING FUNCTION OF PRICES The ability of price changes to bring about changes in the quantities of products and resources demanded and supplied.

H

HERFINDAHL INDEX The sum of the squared percentage market share of all firms in the industry.

HOMOGENEOUS OLIGOPOLY An oligopoly in which the firms produce a standardized product.

HORIZONTAL AXIS The "left–right" or "west–east" axis on a graph or grid.

HORIZONTAL MERGER A merger between two competitors selling similar products in the same market.

HOUSEHOLD An economic unit (of one or more persons) that provides the economy with resources and uses the income received to purchase goods and services that satisfy material wants.

HUMAN CAPITAL DISCRIMINATION Arbitrary restriction of particular groups from productivity-enhancing investments in education and training.

I

ILLEGAL IMMIGRANTS People who enter a country unlawfully and live there.

IMITATION PROBLEM A firm's rivals may be able to imitate the new product or process, greatly reducing the originator's profit from its R&D effort.

IMPERFECT COMPETITION The market models pure monopoly, monopolistic competition, and oligopoly considered as a group.

IMPLICIT COSTS The monetary income a firm sacrifices when it uses a resource it owns rather than supplying the resource in the market; equal to what the resource could have earned in the best-paying alternative employment; includes a normal profit.

IMPORT COMPETITION The competition domestic firms encounter from the products and services of foreign producers.

IMPORT QUOTA A limit imposed by a nation on the quantity (or total value) of a good that may be imported during some period.

INCENTIVE FUNCTION OF PRICE The inducement that an increase in the price of a commodity gives to sellers to make more of it available (and conversely for a decrease in price), and the inducement that an increase in price offers to buyers to purchase smaller quantities (and conversely for a decrease in price).

INCENTIVE PAY PLAN A compensation structure that ties worker pay directly to performance such as piece rates, bonuses, stock options, commissions, and profit sharing.

INCLUSIVE UNIONISM The practice of a labour union of including as members all workers employed in an industry.

INCOME EFFECT A change in the quantity demanded of a product that results from the change in real income (purchasing power) produced by a change in the product's price.

INCOME ELASTICITY OF DEMAND The ratio of the percentage change in the quantity demanded of a good to a percentage change in consumer income; measures the responsiveness of consumer purchases to income changes.

INCOME INEQUALITY The unequal distribution of an economy's total income among households or families.

INCOME MOBILITY The movement of individuals and families from one income quintile to another over time.

INCREASING-COST INDUSTRY An industry in which the entry of new firms raises the prices for resources and thus increases their production costs.

INDEPENDENT VARIABLE The variable causing a change in some other (dependent) variable.

INDIFFERENCE CURVES Curves showing the different combinations of two products that yield the same satisfaction or utility to a consumer.

INDIFFERENCE MAP A series of indifference curves, each of which represents a different level of utility and together show the preferences of a consumer.

INDUSTRY A group of firms that produce the same or similar products.

INELASTIC DEMAND Product or resource demand for which the price elasticity coefficient is less than one; means the resulting percentage change in quantity demanded is less than the percentage change in price.

INFERIOR GOOD A good or service whose consumption declines as income rises (and conversely), price remaining constant.

INNOVATION The first successful commercial introduction of a new product, the first use of a new method of production, or the creation of a new form of business organization.

INSURABLE RISK An event that would result in a loss but whose frequency of occurrence can be estimated with considerable accuracy; insurance companies are willing to sell insurance against such losses.

INTEREST-RATE COST-OF-FUNDS CURVE A graph showing the interest rate a firm must pay to obtain funds to finance R&D.

INTERINDUSTRY COMPETITION The competition between the products of one industry and the products of another industry.

INVENTION The discovery of a product or process using imagination, ingenious thinking, and experimentation and the first proof that it will work.

INVERSE RELATIONSHIP The relationship between two variables that change in opposite directions, for example, product price and quantity demanded.

INVERTED-U THEORY A theory saying that, other things being equal, R&D expenditures as a percentage of sales rise with industry concentration, reach a peak at a four-firm concentration ratio of about 50 percent, and then fall as concentration further increases.

INVESTMENT IN HUMAN CAPITAL Any expenditure undertaken to improve the education, skills, health, or mobility of workers, with an expectation of greater productivity and thus a positive return on the investment.

INVESTMENT Spending for the production and accumulation of capital and additions to inventories.

INVISIBLE HAND The tendency of firms and resource suppliers seeking to further their own self-interests in competitive markets to also promote the interest of society as a whole.

K

KINKED-DEMAND CURVE The demand curve for a noncollusive oligopolist that is based on the assumption that rivals will follow a price decrease and will not follow a price increase.

L

LABOUR The physical and mental talents and efforts of people that are used to produce goods and services.

LAND Natural resources (“free gifts of nature”) used to produce goods and services.

LAW OF CONSERVATION OF MATTER AND ENERGY Matter can be transformed into other matter or into energy but never vanish.

LAW OF DEMAND The principle that, other things equal, an increase in a product’s price will reduce the quantity of it demanded; and conversely for a decrease in price.

LAW OF DIMINISHING MARGINAL UTILITY As a consumer increases the consumption of a good or service, the marginal utility obtained from each additional unit of the good or service decreases.

LAW OF DIMINISHING RETURNS As successive increments of a variable resource are added to a fixed resource, the marginal product of the variable resource will eventually decrease.

LAW OF INCREASING OPPORTUNITY COSTS As the production of a good increases, the opportunity cost of producing an additional unit rises.

LAW OF SUPPLY The principle that, other things equal, an increase in the price of a product will increase the quantity of it supplied; and conversely for a price decrease.

LEAST-COST COMBINATION OF RESOURCES The quantity of each resource a firm must employ to produce a particular output at the lowest total cost.

LEGAL CARTEL THEORY OF REGULATION The hypothesis that some industries seek regulation or want to maintain regulation so that they may form a legal cartel.

LEGAL IMMIGRANTS People who lawfully enter a country and live there.

LIMITED LIABILITY Restriction of the maximum loss to a predetermined amount for the owners (stockholders) of a corporation, the maximum loss is the amount they paid for their shares of stock.

LOANABLE FUNDS THEORY OF INTEREST The concept that the supply of and demand for loanable funds determine the equilibrium rate of interest.

LOGROLLING The trading of votes by legislators to secure favourable outcomes on decisions concerning the provision of public goods and quasipublic goods.

LONG RUN A period of time long enough to enable producers of a product to change the quantities of all the resources they employ; period in which all resources and costs are variable and no resources or costs are fixed.

LONG-RUN FARM PROBLEM The tendency for agriculture to be a declining industry as technological progress increases supply relative to an inelastic and slowly increasing demand.

LONG-RUN SUPPLY CURVE A curve that shows the prices at which a purely competitive industry will make various quantities of the product available in the long run.

LORENZ CURVE A curve showing the distribution of income in an economy; the cumulated percentage of families (income receivers) is measured along the horizontal axis and cumulated percentage of income is measured along the vertical axis

M

MACROECONOMICS The part of economics concerned with the economy as a whole; with such major aggregates as the household, business, and governmental sectors; and with measures of the total economy.

MARGINAL ANALYSIS The comparison or marginal ("extra" or "additional") benefits and marginal costs, usually for decision making.

MARGINAL COST (MC) The extra (additional) cost of producing one more unit of output; equal to the change in total cost divided by the change in output (and in the short run to the change in total variable cost divided by the change in output).

MARGINAL PRODUCT (MP) The extra output produced with one additional unit of a resource.

MARGINAL PRODUCTIVITY THEORY OF INCOME DISTRIBUTION The contention that the distribution of income is fair when each unit of each resource receives a money payment equal to its marginal contribution to the firm's revenue (its marginal revenue product).

MARGINAL RATE OF SUBSTITUTION The rate at which a consumer is prepared to substitute one good for another (from a given combination of goods) and remain equally satisfied (have the same total utility); equal to the slope of a consumer's indifference curve at each point on the curve.

MARGINAL RESOURCE COST (MRC) The amount that each additional unit of resource adds to the firm's total (resource) cost.

MARGINAL REVENUE PRODUCT (MRP) The change in total revenue from employing one additional unit of a resource.

MARGINAL REVENUE PRODUCTIVITY How much workers contribute to their employers' revenue; usually reflected in their pay level.

MARGINAL REVENUE The change in total revenue that results from selling one more unit of a firm's product.

MARGINAL UTILITY The extra utility a consumer obtains from the consumption of one additional unit of a good or service; equal to the change in total utility divided by the change in the quantity consumed.

MARKET FOR EXTERNALITY RIGHTS A market in which firms can buy rights to discharge pollutants; the price of such rights is determined by the demand for the right and a perfectly inelastic supply of such rights (the latter is determined by the quantity of discharges that the environment can assimilate).

MARKET PERIOD A period in which producers of a product are unable to change the quantity produced in response to a change in its price; in which there is a perfectly inelastic supply.

MARKET SYSTEM All the product and resource markets of a market economy and the relationships among them; a method that allows the prices determined in these markets to allocate the economy's scarce resources and to communicate and coordinate the decisions made by consumers, firms, and resource suppliers.

MARKET Any institution or mechanism that brings together buyers (demanders) and sellers (suppliers) of a particular good or service.

MC = MB RULE For a government project, marginal benefit should equal marginal cost to produce maximum benefit to society.

MEDIAN-VOTER MODEL The theory that under majority rule the median (middle) voter will be in the dominant position to determine the outcome of an election.

MEDIUM OF EXCHANGE Items sellers generally accept and buyers generally use to pay for a good or service; money; a convenient means of exchanging goods and services without engaging in barter.

MICROECONOMICS The part of economics concerned with such individual units as industries, firms, and households; and with individual markets, particular prices, and specific goods and services.

MINIMUM EFFICIENT SCALE (MES) The lowest level of output at which a firm can minimize long-run average costs.

MINIMUM WAGE The lowest wage employers may legally pay for an hour of work.

MONEY Any item that is generally acceptable to sellers in exchange for goods and services.

MONOPOLISTIC COMPETITION A market structure in which many firms sell a differentiated product and entry into and exit from the market is relatively easy.

MONOPSONY A market structure in which there is only a single buyer of a good, service, or resource.

MORAL HAZARD PROBLEM The possibility that individuals or institutions will change their behaviour as the result of a contract or agreement.

MOST-FAVOURED-NATION (MFN) CLAUSE An agreement by Canada to allow some other nation's exports into Canada at the lowest tariff level levied by Canada, then or later.

MR = MC RULE A method of determining the total output at which economic profit is at a maximum (or losses at a minimum).

MRP = MRC RULE To maximize economic profit (or minimize losses) a firm should use the quantity of a resource at which its marginal revenue product is equal to its marginal resource cost.

MULTINATIONAL CORPORATION A firm that owns production facilities in other countries and produces and sells its product abroad.

MUTUAL INTERDEPENDENCE A situation in which a change in strategy (usually price) by one firm will affect the sales and profits of other firms.

N

NATURAL MONOPOLY An industry in which economies of scale are so extensive that a single firm can supply the entire market at a lower unit cost than could a number of competing firms.

NATURAL MONOPOLY An industry in which economies of scale are so great that a single firm can produce the product at a lower average total cost than if more than one firm produced the product.

NETWORK EFFECTS Increases in the value of a product to each user, including existing ones, as the total number of users rises.

NOMINAL INTEREST RATE The interest rate expressed in terms of annual amounts currently charged for interest and not adjusted for inflation.

NOMINAL WAGE The amount of money received by a worker per unit of time (hour, day, etc.).

NONCASH TRANSFER Government transfer payments in the form of goods and services rather than money; for example, food stamps, housing assistance, and job training; also called in-kind transfers.

NONCOMPETING GROUPS Collections of workers in the economy who do not compete with each other for employment because the skill and training of the workers in one group are substantially different from those in other groups.

NONPRICE COMPETITION A selling strategy in which one firm tries to distinguish its product or service from all competing ones based on attributes other than price and then advertising the distinguished product to consumers.

NON-TARIFF BARRIERS All barriers other than protective tariffs that nations erect to impede international trade, including import quotas, licensing requirements, unreasonable product-quality standards, unnecessary red tape in customs procedures, and so on.

NORMAL GOOD A good or service whose consumption increases when income increases and falls when income decreases, price remaining constant.

NORMAL PROFIT The payment made by a firm to obtain and retain entrepreneurial ability; the minimum income entrepreneurial ability must receive to induce it to perform entrepreneurial functions for a firm.

NORMATIVE ECONOMICS The part of economics involving value judgments about what the economy should be like; concerned with which economic goals and policies should be implemented.

NORTH AMERICAN FREE TRADE AGREEMENT (NAFTA) A 1993 agreement establishing, over a 15-year period, a free trade zone composed of Canada, Mexico, and the United States.

O

OCCUPATIONAL DISCRIMINATION Arbitrary restriction of particular groups from more desirable, higher-paying occupations.

OCCUPATIONAL LICENSING The laws of provincial or municipal governments that require a worker to satisfy certain specified requirements and obtain a licence from a licensing board before engaging in a particular occupation.

OCCUPATIONAL SEGREGATION Crowding women or minorities into less desirable, lower-paying occupations.

OLD AGE SECURITY (OAS) A pension paid on application at age 65 to everyone resident in Canada for at least 10 years immediately before turning 65.

OLIGOPOLY A market structure in which a few large firms produce homogeneous or differentiated products.

OPPORTUNITY COST The amount of other products that must be forgone or sacrificed to produce a unit of a product.

OPTIMAL AMOUNT OF R&D The amount of funding for which the expected rate of return and the interest cost of borrowing are equal.

OPTIMAL REDUCTION OF AN EXTERNALITY The point at which society's marginal cost and marginal benefit of reducing that externality are equal.

OTHER-THINGS-EQUAL ASSUMPTION The assumption that factors other than those being considered are held constant.

OUTPUT EFFECT An increase in the price of one input will increase a firm's production costs and reduce its level of output, thus reducing the demand for other inputs (and vice versa).

P

PARADOX OF VOTING A situation in which paired-choice voting by majority rule fails to provide a consistent ranking of society's preferences for public goods or services.

PARTNERSHIP An unincorporated firm owned and operated by two or more people.

PATENT An exclusive right to sell any new and useful process, machine, or product for a set time.

PERFECTLY ELASTIC DEMAND Product or resource demand in which quantity demanded can be of any amount at a particular product price; graphs as a horizontal demand curve.

PERFECTLY ELASTIC SUPPLY Product or resource supply in which quantity supplied can be of any amount at a particular product or resource price; graphs as a horizontal supply curve.

PERFECTLY INELASTIC DEMAND Product or resource demand in which price can be of any amount at a particular quantity of the product or resource demanded; quantity demanded does not respond to a change in price; graphs as a vertical demand curve.

PERFECTLY INELASTIC SUPPLY Product or resource supply in which price can be of any amount at a particular quantity of the product or resource demanded; quantity supplied does not respond to a change in price; graphs as a vertical supply curve.

PLANT A physical establishment that performs one or more functions in the production, fabrication, and distribution of goods and services.

POLICY ECONOMICS The formulation of courses of action to bring about desired economic outcomes or to prevent undesired occurrences.

POSITIVE ECONOMICS The analysis of facts or data to establish scientific generalizations about economic behaviour.

POST HOC, ERGO PROPTER HOC FALLACY Incorrectly reasoning that when one event precedes another the first event must have caused the second event.

PRICE CEILING A legally established maximum price for a good or service.

PRICE DISCRIMINATION The selling of a product to different buyers at different prices when the price differences are not justified by differences in cost.

PRICE ELASTICITY OF DEMAND The ratio of the percentage change in quantity demanded of a product or resource to the percentage change in its price; a measure of the responsiveness of buyers to a change in the price of a product or resource.

PRICE ELASTICITY OF SUPPLY The ratio of the percentage change in quantity supplied of a product or resource to the percentage change in its price; the responsiveness of producers to a change in the price of a product or resource.

PRICE FLOORS Legally determined prices above the equilibrium price.

PRICE LEADERSHIP An implicit understanding oligopolists use to coordinate prices without engaging in outright collusion by having the dominant firm initiate price changes and all other firms follow.

PRICE WAR Successive and continuous rounds of price cuts by rivals as they attempt to maintain their market shares.

PRICE-TAKER A firm in a purely competitive market that cannot change market price but only adjust to it.

PRINCIPAL–AGENT PROBLEM A conflict of interest that occurs when agents (workers or managers) pursue their own objectives to the detriment of the principal's (stockholders) goals.

PRINCIPALS Statements about economic behaviour that enable prediction of the probable effect of certain actions.

PRIVATE PROPERTY The right of private persons and firms to obtain, own, control, employ, dispose of, and bequeath land, capital, and other property.

PROCESS INNOVATION The development and use of new or improved production or distribution methods.

PRODUCER SURPLUS The difference between what producers receive for a product or service and the marginal cost of producing it.

PRODUCT DIFFERENTIATION A strategy in which one firm's product is distinguished from competing products by means of its design, related services, quality, location, or other attributes (except price).

PRODUCT INNOVATION The development and sale of a new or improved product or service.

PRODUCT MARKET A market in which products are sold by firms and bought by households.

PRODUCTION POSSIBILITIES CURVE A curve that shows the different combinations of two goods or services that can be produced in a full-employment, full-production economy where the available supplies of resources and technology are fixed.

PRODUCTION POSSIBILITIES TABLE A table showing the different combinations of two products that can be used produced with a specific set of resources in a full-employment, full-production economy.

PRODUCTIVE EFFICIENCY The production of a good in the least costly way; occurs when production takes place at the output at which average total cost is a minimum and at which marginal product per dollar's worth of input is the same for all inputs.

PROFIT-MAXIMIZING COMBINATION OF RESOURCES The quantity of each resource a firm must employ to maximize its profits or minimize its losses.

PROGRESSIVE TAX A tax whose average tax rate increases as the taxpayer's income increases and decreases as the taxpayer's income decreases.

PROPORTIONAL TAX A tax whose average tax rate remains constant as the taxpayer's income increases or decreases.

PROTECTIVE TARIFF A tariff designed to shield domestic producers of a good or service from the competition of foreign producers.

PUBLIC CHOICE THEORY The economic analysis of collective and government decision making, politics, and the democratic process.

PUBLIC GOOD A good or service that is indivisible and to which the exclusion principle does not apply; a good or service with these characteristics provided by government.

PUBLIC INTEREST THEORY OF REGULATION The theory that industrial regulation is necessary to keep a natural monopoly from charging monopoly prices and thus harming consumers and society.

PURE COMPETITION A market structure in which a very large number of firms produce a standardized product.

PURE MONOPOLY A market structure in which one firm is the sole seller of a product or service.

PURE RATE OF INTEREST An essentially risk-free, long-term interest rate not influenced by market imperfections.

PURELY COMPETITIVE LABOUR MARKET A resource market in which a large number of (noncolluding) firms demand a particular type of labour supplied by a large number of nonunion workers.

Q

QUASI-PUBLIC GOOD A good or service to which the exclusion principle could apply, but that has such a large spillover benefit that government sponsors its production to prevent an underallocation of resources.

R

RATIONAL BEHAVIOUR Human behaviour based on comparison of marginal costs and marginal benefits; behaviour designed to maximize total utility.

RATIONING FUNCTION OF PRICES The ability of market forces in a competitive market to equalize quantity demanded and quantity supplied and to eliminate shortages and surpluses via changes in prices.

REAL INTEREST RATE The interest rate expressed in dollars of constant value (adjusted for inflation); equal to the nominal interest rate less the expected rate of inflation.

REAL WAGE The amount of goods and services a worker can purchase with a nominal wage; the purchasing power of the nominal wage.

REGRESSIVE TAX A tax whose average tax rate decreases as the taxpayer's income increases and decreases as the taxpayer's income decreases.

RELATIVE POVERTY A situation in which an individual's or a family's income is low relative to others in society.

RENT-SEEKING BEHAVIOUR The actions by persons, firms, or unions to gain special benefits from government at taxpayers' or someone else's expense.

RESOURCE MARKET A market in which households sell and firms buy resources or the services of resources.

REVERSE DISCRIMINATION The view that the preferential treatment associated with employment equity constitutes discrimination against other groups.

ROUNDABOUT PRODUCTION The construction and use of capital to aid in the production of consumer goods.

S

SCIENTIFIC METHOD The systematic pursuit of knowledge through the formulation of a problem, collection of data, and the formulation and testing of hypotheses.

SELF-INTEREST That which each firm, property owner, worker, and consumer believes is best for itself and seeks to obtain.

SHORT RUN A period of time in which producers are able to change the quantities of some but not all of the resources they employ; a period in which some resources (usually plant) are fixed and some are variable.

SHORTAGE The amount by which the quantity demanded of a product exceeds the quantity supplied at a particular (below-equilibrium) price.

SHORT-RUN FARM PROBLEM The sharp year-to-year changes in the prices of agricultural products and in the incomes of farmers.

SHORT-RUN SUPPLY CURVE A curve that shows the quantities of the product a firm in a purely competitive industry will offer to sell at various prices in the short run.

SIMULTANEOUS CONSUMPTION A product's ability to satisfy a large number of consumers at the same time.

SINGLE-TAX MOVEMENT A movement spearheaded by Henry George in the late nineteenth century to make taxes on rental income the only tax levied by government; few advocates remain.

SLOPE OF A LINE The ratio of the vertical change (the rise or fall) to the horizontal change (the run) between any two points on a line. The slope of an upward sloping line is positive, reflecting a direct relationship between two variables; the slope of a downward sloping line is negative, reflecting an inverse relationship between two variables.

SOCIAL REGULATION Government regulation of the conditions under which goods are produced, the physical characteristics of goods, and the impact of the production on society.

SOCIALLY OPTIMAL PRICE The price of a product that results in the most efficient allocation of an economy's resources.

SOLE PROPRIETORSHIP An unincorporated firm owned and operated by one person.

SPECIAL-INTEREST EFFECT Any result of government promotion of the interests (goals) of a small group at the expense of a much larger group.

SPECIALIZATION The use of the resources of an individual, a firm, a region, or a nation to produce one or a few goods and services.

SPILLOVER BENEFIT A benefit obtained without compensation by third parties from the production or consumption of sellers or buyers. Example: A beekeeper benefits when a neighbouring farmer plants clover.

SPILLOVER COSTS A cost imposed without compensation on third parties by the production or consumption of sellers or buyers. Example: A manufacturer dumps toxic chemicals into a river, killing the fish sought by sport fishers.

START-UPS Small new companies that focus on creating and introducing a new product or employing a new production or distribution technique.

STATIC ECONOMY An economy in which resource supplies, technological knowledge, and consumer tastes are constant and unchanging.

STATISTICAL DISCRIMINATION Judging individuals on the average characteristic of the group to which they belong rather than on their own personal characteristics.

STOCKS (CORPORATE) Ownership shares in a corporation.

SUBSTITUTE GOODS Products or services that can be used in place of each other. When the price of one falls the demand for the other falls, and conversely with an increase of price.

SUBSTITUTION EFFECT (1) A change in the quantity demanded of a consumer good that results from a change in its relative expensiveness produced by a change in the product's price. (2) The effect of a change in the price of a resource on the quantity of the resource employed by a firm, assuming no change in its output.

SUPPLY CURVE A curve that illustrates supply.

SUPPLY SCHEDULE A schedule showing the amounts of a good or service sellers (or a seller) will offer at various prices during some period.

SUPPORT PRICES Government-supported minimum prices for agricultural products.

SURPLUS The amount by which the quantity supplied of a product exceeds the quantity demanded at a specific (above-equilibrium) price.

T

TACIT UNDERSTANDINGS Any method by competing oligopolists to set prices and outputs that does not involve outright collusion.

TASTE-FOR-DISCRIMINATION MODEL A theory of discrimination that views it as a preference for which an employer is willing to pay.

TAX INCIDENCE The person or group who ends up paying a tax.

TECHNOLOGICAL ADVANCE New and better goods and services and new and better ways of producing or distributing them.

TERMS OF TRADE The rate at which units of one product can be exchanged for units of another product; the price of a good or service; the amount of one good or service that must be given up to obtain one unit of another good or service.

THEORETICAL ECONOMICS The process of deriving and applying economic theories and principals.

TOTAL COST The sum of fixed cost and variable cost.

TOTAL PRODUCT (TP) The total output of a particular good or service produced by a firm (or a group of firms or the entire economy).

TOTAL REVENUE The total number of dollars received by a firm (or firms) from the sale of a product; equal to the total expenditures for the product produced by the firm (or firms); equal to the quantity sold (demanded) multiplied by the price at which it is sold.

TOTAL UTILITY The total amount of satisfaction derived from the consumption of a single product or a combination of products.

TOTAL-REVENUE TEST A test to determine elasticity of demand between any two prices: Demand is elastic if total revenue moves in the opposite direction as price; it is inelastic when it moves in the same direction as price; and it is of unitary elasticity when it does not change when price changes.

TRADE BLOC A group of nations that lower or abolish trade barriers among members. Examples include the European Union and the nations of the North American Free Trade Agreement.

TRADEOFF BETWEEN EQUALITY AND EFFICIENCY The decrease in economic efficiency that may accompany a decrease in income inequality; the presumption that some income inequality is required to achieve economic efficiency.

TRADEOFFS The sacrifice of some or all of one economic goal, good, or service to achieve some other goal, good, or service.

TRAGEDY OF THE COMMONS Air, water, and public land rights are held in common by society and freely available, so no incentive exists to maintain or use them carefully; the result is overuse, degradation, and pollution.

U

UNINSURABLE RISK An event that would result in a loss and whose occurrence is uncontrollable and unpredictable; insurance companies are not willing to sell insurance against such a loss.

UNIT ELASTICITY Demand or supply for which the elasticity coefficient is equal to one; means that the percentage change in the quantity demanded or supplied is equal to the percentage change in price.

USURY LAWS State laws that specify the maximum legal interest rate at which loans can be made.

UTILITY The want-satisfying power of a good or service; the satisfaction or pleasure a consumer obtains from the consumption of a good or service (or from the consumption of a collection of goods and services).

UTILITY-MAXIMIZING RULE To obtain the greatest utility the consumer should allocate money income so that the last dollar spent on each good or service yields the same marginal utility.

V

VALUE ADDED TAX (VAT) A tax imposed on the difference between the value of the products sold by a firm and the value of the goods purchased from other firms to produce the product; used in several European countries.

VARIABLE COSTS Costs that in total increase when the firm increases its output and decrease when it reduces its output.

VENTURE CAPITAL Financial capital lent in return for a share in the business.

VERTICAL AXIS The “up–down” or “north–south” axis on a graph or grid.

VERTICAL INTERCEPT The point at which a line meets the vertical axis of a graph.

VERTICAL MERGER The merger of firms engaged in different stages of production process of a final product.

VERY LONG RUN A period in which technology can change and in which firms can develop and offer entirely new products.

W

WAGE DIFFERENTIALS The difference between the wage received by one worker or group of workers and that received by another worker or group of workers.

WAGE DISCRIMINATION The payment of a lower wage to members of a less-preferred group than to members of a more-preferred group for the same work.

WORLD TRADE ORGANIZATION (WTO) An organization established in 1994, replacing GATT, to oversee the provisions of the Uruguay Round and resolve any disputes stemming from it.

X

X-INEFFICIENCY Failure to produce any specific output at the lowest average (and total) cost possible.

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